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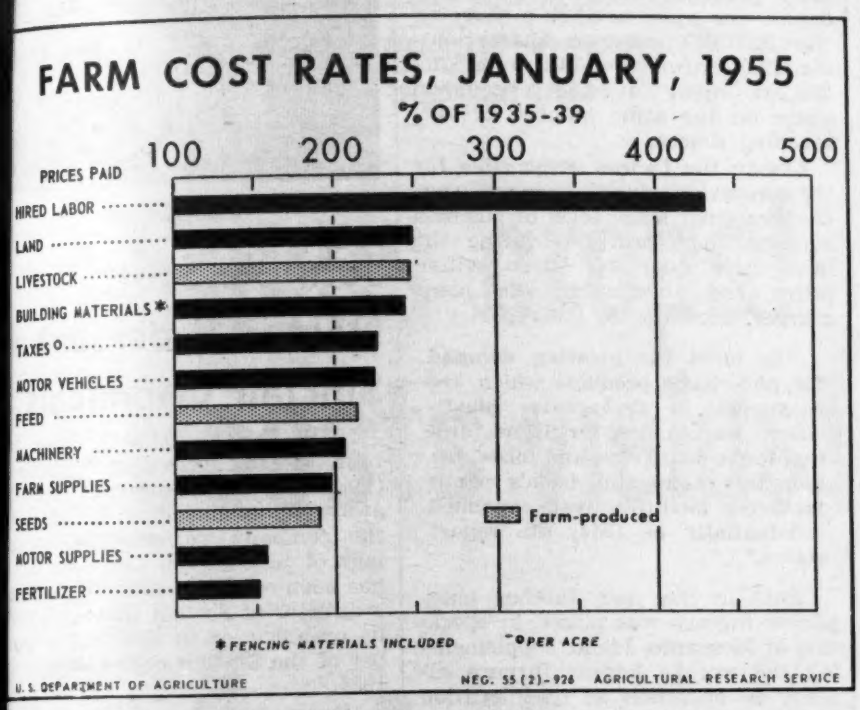

BEST BUY—The U.S. Department of Agriculture chart above shows that fertilizer today is the farmer's best buy, on the basis of price comparison with 1935-39. While prices paid and received by farmers generally have more than doubled since that period, the price of fertilizer has increased only 52%.

Fertilizer Best Buy in Farm Price Squeeze, USDA Says

WASHINGTON—Prices of plant nutrients in fertilizer, on the average, are slightly lower than they were a year ago, and prices of most pesticides have remained unchanged since last September, the U.S. Department of Agriculture notes in its current issue of the Farm Cost Situation.

Reductions in fertilizer price apply especially to high analysis mixtures, according to the publication. Those containing smaller percentages of plant nutrients are largely unchanged.

The publication points out that fertilizer is a "best buy" for the farmer in this period of rising farm production costs.

"From the viewpoint of farm costs, the fact that the increase in the price of fertilizer has for a number of years been less than the increase in farm costs and prices generally is important," it states.

"Although prices paid and received by farmers in general have more than doubled since 1935-39, the price of fertilizer has increased about 52%. Thus compared with prewar, fertilizer is relatively cheap."

(Last June a study by the National Fertilizer Assn. in cooperation with the U.S. Department of Agriculture showed that, on the basis of plant food content, fertilizer prices had advanced only 12% since 1935. See page 1 of the June 28 issue of Croplife.)

Of 22 important pesticide materials, manufacturers' prices of only three have changed in the last five months, Farm Cost Situation reports. Prices of toxaphene are slightly higher and those for parathion and 2,4-D are slightly lower.

"Current stocks are about 10% smaller than a year earlier largely because excessive stocks of some pesticides have been reduced," the report states.

"Stocks of individual pesticides vary considerably. Stocks of aldrin are only about half as large as a year earlier. Lead arsenate and copper sulfate are about 70% and calcium arsenate about 80% of a year ago.

"On the other hand stocks of benzene hexachloride, chlordane and DDT are each about 20% larger than a year earlier."

Inside You'll Find

Insect Notes	4
Over the Counter	9
Field Notes	9
Bug of the Week	10
What's New	12
World Report	18
Editorials	22
Meeting Memos	23
Index of Advertisers	23

Sales, Research Stressed at First Meeting of National Nitrogen Solution Group

By LAWRENCE A. LONG
Editor of Croplife

OMAHA, NEB.—Probably one of the greatest collections of liquid nitrogen tanks, applicators, pumps, and other accessories ever to be assembled under one roof, jammed the lobby and mezzanine floors of the Paxton Hotel here, March 14 and 15, marking the occasion of the first annual meeting of the National Nitrogen Solution Dealers Association. The group elected officers, heard talks on sales promotion, soils testing, research, and insecticide-fertilizer combinations during the two day meeting.

Officers were named unanimously by the board of directors as follows: Wayne Johnson, Johnson Bros. Mills, Shenandoah, Iowa, president; Richard Cecil, American Nitrogen Co., Dayton, Ohio, vice president; John White of the John White Fertilizer Co., Auburn, Neb., secretary, and George Serviss, GLF Soil Building Service, Ithaca, N.Y., treasurer. Mr. Johnson had headed the National Nitrogen Solution Dealers Assn. since its beginning and was chairman of the Omaha meeting.

Leading the rather impressive array of speakers, was Walter Colvin, sales manager of the northern region for Allied Chemical & Dye Corporation's Nitrogen Division. Speaking on the subject of "advertising, merchandising, and promotion of nitrogen solutions," Mr. Colvin told the group that the key to the whole situation is contained in the admonition, "get up and sell."

He reviewed the history of the nitrogen solutions industry, pointing out the various limiting factors which early in the game hampered development. First, was the relatively small amount of liquid nitrogen available for the trade. He indicated that it took a considerable amount of courage for the early developers of this business to invest large sums of money and manufacturing facilities, but now that the idea of nitrogen solutions has caught on, it is "definitely here to stay."

The second limiting factor, he said, lay in the lack of suitable tanks for the storage of nitrogen solutions. In this regard, he gave the dealers great credit for stepping into the picture and helping out. In 1950, when nitrogen solutions were getting on their way, aluminum was not available for

(Continued on page 8)

Phillips Acquires Interest in New Potash Company

OKLAHOMA CITY — Phillips Chemical Co. has acquired a quarter interest in a new corporation formed to develop potash holdings in New Mexico.

The new firm, to be known as the Farmers Corp., was formed March 12 by the signing of an agreement by National Farmers Union, Denver, and Kerr-McGee Oil Industries, Oklahoma City.

At the same time, it was announced that Phillips has acquired a half interest in the Kerr-McGee holdings in the new firm.

Under the agreement, Kerr-McGee will develop NFU potash holdings in Lea and Eddy counties in New Mexico. NFU will distribute the potash.

(For background on the project, see page 1 of the Nov. 1 Croplife and

(Continued on page 21)

Production Conference Hears of New Pesticide Tools for Cotton Grower

PHOENIX—The tools provided to the cotton grower by the agricultural chemicals industry were reviewed at the fourth annual Western Cotton Production Conference, held at Hotel Westward Ho here March 8-9.

About 400 persons attended the event, which was sponsored by the Southwest Five-State Cotton Growers Assn. and the National Cotton Council of America.

Systemic insecticides, chemical disease control, defoliation and weed control were among the topics covered. In addition to reports on the technical aspects of these subjects, delegates at the conference heard growers tell how application of farm chemical know-how in the field paid off in fat yields.

Systemic insecticides promise to be one of the greatest steps in the history of insect control, but much research is necessary before this may come about, delegates were told.

"Perhaps the phase of research that promises the greatest return and that needs expanding most at the present time is the study of systemic insecticides," K. P. Ewing, Entomology Research Branch, U.S. Department of Agriculture, said.

J. C. Gaines, head of the Department of Entomology, Texas A&M College System, said that proper application of systemics spares beneficial insects, since only those bugs that chew on or suck the foliage and stem are affected. Since the material is inside the plant, it is not lost from weathering.

Another advantage of systemics, Dr. Gaines added, is the savings in time, labor and capital. These compounds are "translocated" to new

(Continued on page 20)

Du Pont Sales For 1954 Total $1,688 Million

WILMINGTON — Du Pont sales reached $1,688 million in 1954 — a year "of high industrial activity" for the company—Crawford H. Greenewalt, president, disclosed recently in his annual report to 150,000 stockholders. During the year the company put $120 million into plant and laboratory expansion.

The sales total was a decrease of 3.5% from the 1953 record high of $1,750 million. For each of the first three quarters they were steady at a level about 8% below corresponding 1953 periods. However, there was a substantial upturn in sales in the fourth quarter which totaled $456 million, 10% above that quarter of 1953.

The company's average operating investment, the report said, increased to $1,996 million, which was 7% over the 1953 average of $1,866 million. Operating investment per employee went up to $23,000 as compared with $20,000 in 1953.

As announced by the company previously, earnings for 1954 were $7.33 per common share against $4.94 a share in 1953, the increase being due primarily to expiration of the so-called "excess profits" tax.

Total earnings came to $344 million, including $252 million from Du Pont sources and $92 million from General Motors Corp. dividends. This compares with $236 million for 1953, which included $162 million from Du Pont sources and $74 million from General Motors dividends.

Earnings from Du Pont sources before taxes were $10.81 per common share, or $1.28 lower than the $12.09 for 1953, due chiefly to lower sales volume and decreased selling prices. However, earnings from Du Pont sources after taxes were $5.30 per share, compared with $3.31 for 1953. Total dividends were $261 million, or 76% of earnings.

The company's estimate of federal taxes on income, and of renegotiation, for 1954, was $258 million, equal to $5.67 per common share, slightly above the common stock dividend of $5.50. This compares with taxes of $405 million, or $8.91 per share, for 1953.

The company spent $61 million on research last year, exclusive of construction.

The report described the company's new safety record, best in its history, as "the result of excellent cooperation among employees throughout the company." The frequency rate for lost-time injuries was 0.33 per million man-hours worked, compared with the best previous rate of 0.55 for 1953. Latest available rate for the chemical industry is 4.53 and for all industry, 7.44.

The report also noted the company's contributions in educational fields in which, over the years, it has sponsored a number of programs in support of scientific education in colleges and universities. In 1954, it appropriated $805,000 for grants for the 1955-56 academic year.

Ray F. Mickels in New CSC Agricultural Chemicals Post

NEW YORK—Ray F. Mickels has joined the Agricultural Chemicals Sales Dept. of Commercial Solvents Corp., it was announced March 10 by Clyde Marshall, general manager of the department.

Mr. Mickels will handle the sale and distribution of CSC ammonium nitrate to the Midwest fertilizer trade. Mr. Mickels, who has been with CSC since 1951, will make his headquarters at Aurora, Ill.

Shell Chemical Opens New Sales Office in Columbus

NEW YORK—The Agricultural Chemicals Division of Shell Chemical Corp. has opened a new sales office in Columbus, Ohio, Frederick W. Hatch, division manager, announced recently. Under the direction of S. J. Hastings, district manager in New York, the office will be headed by J. H. Hawke with C. J. Green as technical salesman.

Responsible for sales of Shell Chemical insecticides, aldrin, dieldrin and endrin, the office will serve as headquarters for representatives in Ohio, Kentucky, Michigan and West Virginia. It is located at 1220 Goodale Blvd.; phone Walnut 1102.

Errol H. Karr New Vice President Of Penn Salt

TACOMA, WASH. — Appointment of Errol H. Karr to the position of vice president, Pennsylvania Salt Manufacturing Company of Washington, was announced March 1 by Fred C. Shanaman, president.

Mr. Karr, formerly manager, Technical Development, served in several technical and administrative capacities during his 20 years with Penn Salt. From Yakima, Wash., he started his Penn Salt career in the experimental field of agricultural chemicals and later served Penn Salt's western subsidiary in such capacities as chief chemist, superintendent, Portland, Ore. plant, technical supervisor and manager of agricultural chemicals.

Loaned to the military government at end of World War II as a technical consultant, Mr. Karr participated in two European missions: Joint Intelligence Objective Agency (JIOA) and the Field Intelligence Agency Technical (FIAT) to report on German chemical technology.

300 Attend Kansas Fertilizer Meeting

HOME CITY, KANSAS—Over 300 persons attended a recent fertilizer education meeting at Marysville, Kansas, sponsored by the Roy Lewis Feed Co. of Home City. It was one of the most successful fertilizer meetings of the series which the company has held.

Chief speaker of the evening was Dr. Floyd Smith, Kansas State College agronomist, who spoke on the supplying of plant food needs for growing crops and the nutrient elements required for wheat, corn, legumes and grasses.

Other speakers included Robert Easley, representing the Olin Mathieson Chemical Corp., St. Louis, and Ed Hedstrom, county agent. A full-length motion picture, "Making the Most of A Miracle," was shown.

FARM FIELD DAY

MADISON, WIS.—Farm Field Day at the University of Wisconsin—an annual event that will center around corn research this year—has been set for Oct. 14 at Charmany farm, two miles west of Madison, according to Noble Clark, associate director of the university's Agricultural Experiment Station. This year the field demonstrations will be built around corn varieties, culture, weed control, seed production, harvesting and use of by-products.

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Monsanto Chemical Sales Register Increase in 1954

ST. LOUIS—Sales of Monsanto Chemical Co. and its consolidated subsidiaries for 1954 were $341,822,557, an increase of .7% over sales in 1953, according to the firm's 53rd annual report to the stockholders.

Income before taxes for 1954 was $42,554,510, a decrease of 13.7% from pre-tax income of 1953. Net income after taxes was $23,700,510, which, after provision for preference dividends, was equal to $4.39 a share on the 5,270,051 common shares outstanding. Earnings in 1953 were $26,283,205, equal to $4.88 a common share on the same number of outstanding shares.

Among the factors responsible for the company's adverse earnings were the somewhat lower level of business activity which prevailed during the first three quarters, lower selling prices and substantial idle plant charges, according to the report.

"To meet the growing demand for phosphatic products which are consumed in detergents, plasticizers, insecticides, fertilizers, animal feeds, dentifrices and foods, the inorganic chemical division's manufacturing facilities were expanded substantially in 1954, the report states."

"Late in the year another phosphorus furnace was placed in operation at Monsanto, Idaho, supplementing the world's largest furnace already in operation at that location and six furnaces in operation at Monsanto, Tenn. Facilities for preparation of phosphate ore also were enlarged at the Idaho plant.

"The increased availability of elemental phosphorus, keystone chemical of the phosphate industry, was related to other construction of this division. At Long Beach, Calif., a phosphoric acid plant to serve the broadening West Coast industrial area started operating. Construction began at Kearny, N.J., on a plant to produce phosphoric acid and sodium tripolyphosphate by mid-1955. Production of detergents and ammonium phosphates at Trenton, Mich., and of sodium phosphates at Carondelet, Mo., was increased.

"Another phosphoric acid unit was installed at Monsanto, Ill., where facilities were expanded also for production of phosphorus oxychloride and phosphorus trichloride, both used as chlorinating agents and catalysts in preparation of intermediates, dyestuffs and medicinals. Production of phosphorus pentasulfide began at this plant. A 400-ton-per-day sulfuric acid plant and enlarged facilities for manufacture of dodecylbenzene were completed at this location.

"Sales of sodium phosphates to the soap and detergent industry increased. Farmers consumed larger quantities of phosphatic fertilizer solution. Sodium meta-bisulfite, long used by the paper industry, was marketed successfully as a silage preservative (Medo-Green).

"Cooperative work with Colorado Fuel and Iron Corp. resulted in proving the use of electric furnace phosphoric acid in the scrubbing of by-product gas from coke ovens to produce a concentrated fertilizer — diammonium phosphate."

Sales of the Organic Chemicals Division in 1954 were approximately equal to those of the previous year, the report states.

"While floods, drouths and a resultantly low insect population caused reduced consumption of insecticides, sales of other agricultural chemicals, including herbicides, increased," according to the report.

A major expansion of pilot plant and engineering research facilities was completed.

John A. Scott

John A. Scott Named President o Sinclair Chemicals

NEW YORK—John A. Scott ha been elected president of Sincla Chemicals, Inc., effective immed ately, it was announced March 10 b the company, petrochemical subsid iary of Sinclair Oil Corp. Mr. Sco has been executive vice president an a director of Sinclair Chemicals sinc its organization in 1952 and a mem ber of the Sinclair organization sinc 1934.

First employed as a research tech nologist with Sinclair Refining Co. i Chicago, he has held a number o important research positions, an from 1945 to 1951 served as assistan to the vice president in charge o research and development in Ne York. When the Petrochemicals Div sion of Sinclair Refining Co. wa formed in 1951, Mr. Scott was name manager of the division, advancin to his recent position with the estab lishment of the petrochemicals sub sidiary of Sinclair Oil Corp. a yea later.

Mr. Scott also serves as a directo of Sinclair Research Laboratorie and is a director of Calumet Nitroge Products Co. He is a chemical eng neering graduate of the University o Minnesota.

A. M. Powell Named to Stauffer Chemical Post

NEW YORK—A. M. Powell ha been named assistant productio manager in charge of eastern sulphu and insecticide plants for Stauffe Chemical Co., it has been announce by Herman Jockers, director of pro duction.

Mr. Powell, a University of Mary land graduate, will headquarter i Chauncey, N.Y., and will be respon sible for Stauffer agricultural pro duction facilities in New Jersey, Mi souri, Arkansas, Texas, Louisian and Florida. The new appointment effective immediately.

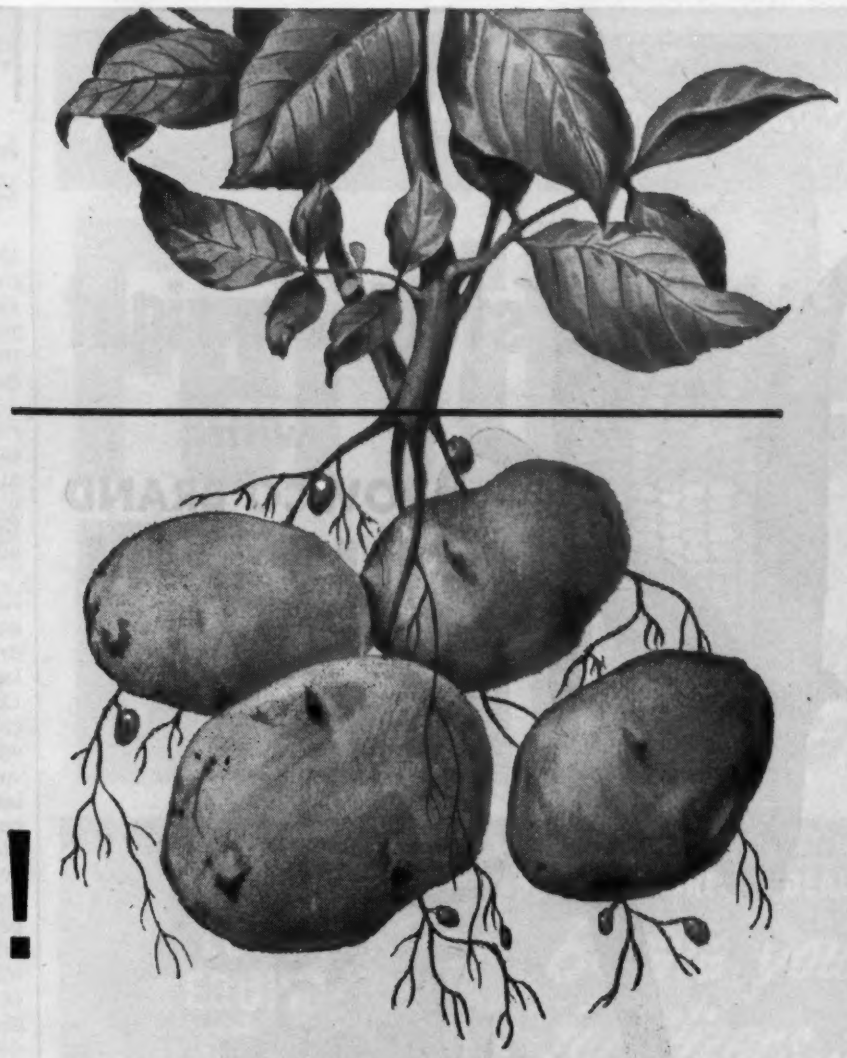
Pacific Coast Borax Opens New Office

NEW YORK—Pacific Coast Bora Co., Division of Borax Consolidate Ltd., has announced the opening a new district sales office at 401 Washington St., Kansas City, Mo.

The office will be a district sal office for three divisions of the com pany, package, agricultural sales, an industrial sales.

Howard B. Cain is the Packa Dept. sales manager for Kansas Ci district, and F. M. Dosch, assisted b J. G. Neckerman, will be in charge the Agricultural Sales Division. Ja Loesel is taking charge of the indu trial sales in the area.

First successful control for many plant diseases and blights—now ready for use this spring



Saves crops! Boosts yields!

Agri-mycin* 100

Commercial vegetable growers can, for the first time, prevent the huge losses of yield and market quality caused by bacterial plant diseases against which—up till now—there has been no effective control. In addition to controlling disease, increased yield and better crop quality result.

For example, even in soils heavily infected with potato blackleg and soft rot, Agri-mycin 100 used as a seed piece dip, produced a full stand of healthy, vigorous plants . . . *yields were increased up to 72 bushels per acre over untreated plantings.*

This last season, Florida tomato and pepper growers, using Agri-mycin 100 as a plant bed spray, averted an epidemic of bacterial spot that threatened thousands of acres . . . *treated tomatoes showed an increased yield of 42%, as well as an increased fruit size of 28%.* Wide-scale tests on many other crop diseases (see list below) are still in progress at state agricultural research stations and by leading growers.

Vegetable growers are reading about Agri-mycin 100 now in advertisements, news stories, and state college bulletins. Be ready to supply it.

At this time, Agri-mycin 100 is recommended for the prevention of:*

BLACKLEG AND SOFT ROT OF POTATO

•

BACTERIAL SPOT OF TOMATO AND PEPPER

•

Also a fast proved control for fire blight of apple and pear, wildfire and blue mold of tobacco, walnut blight, bacterial wilt of chrysanthemums, bacterial leaf rot of philodendron.

Further tests are now in progress to determine most economical control measures for:

HALO BLIGHT and COMMON BLIGHT OF BEANS
BACTERIAL BLIGHT OF PEA
BACTERIAL ROT OF CABBAGE
BACTERIAL SOFT ROT OF CARROT
BACTERIAL WILT OF CUCUMBER
BACTERIAL CANKER OF TOMATO
BACTERIAL WILT OF CORN

One jar makes up to 400 gallons of spray or dip. Water soluble, noncorrosive and nonclogging, nontoxic.
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INSECT AND PLANT DISEASE NOTES

Insect Activity Low in Kansas

MANHATTAN, KANSAS — No greenbugs were found in a survey made in 14 counties of southeastern Kansas; none were found in the western three tiers of counties; and none were found in the 16 counties just east of this area.

Fourteen counties of southeastern Kansas were surveyed for the presence of English grain aphids. These aphids were found only in one wheat field in Montgomery and Elk counties. Counts averaged 1-3 wingless adults per 25 sweeps of a 15-inch net.

A survey of fields in southeast Kansas showed that chinch bugs were actively moving in clumps of bunch grass in which they had overwintered. In a wheat field in western Cherokee County, active bugs were found in clumps of volunteer wheat growing in with the regular crop. This week's survey showed that chinch bugs have begun to move from their winter habitat to wheat and barley fields in Montgomery and Elk counties; however counts obtained averaged only 1-3 bugs per 25 sweeps of a 15-inch net.

No cutworms or evidence of cutworms were found in those fields that were surveyed in southeastern Kansas. Army cutworms were found in wheat fields of most of the counties surveyed in northwest and southwest Kansas. Counts were low; the highe being 8 cutworms per 5 linear fe of row.

Brown wheat mite populations a very low this year in western Ka sas fields. Numerous grasshopp mites were observed in an alfal field in Labette County.—David Matthew.

Vegetable Weevils Increase in Florida

GAINESVILLE, FLA.—Followi are the highlights from the Mar 11 insect pest survey in Florida.

Vegetable weevil reported increa ing and causing damage to tobac beds in the Quincy area. A new di tribution for ant (Tapinoma melan cephalum (F.)) was reported in th Gainesville area.

Serpentine leaf miner reported in creasing and requiring control in th Homestead area. Spotted infestation of Coleopterous larvae were repor ed causing damage to St. Augustin grass at Hollywood, Broward Count —H. A. Denmark.

MINNESOTA GROUND SPRAYERS FORM NEW ORGANIZATION

ST. PAUL—A group of about 40 ground spray operators from all parts of the state met on the University of Minnesota's St. Paul campus recently to lay the groundwork for a new association—the Minnesota Ground Sprayers' Assn.

Its purpose will be to knit together in one group the state's many ground spraying contractors and operators who work to keep both city lawns and wooded areas and farm crops areas clear of weeds and insects.

The organizing group chose Fred Helmstettler, Madison, to be its chairman and appointed five other ground spray operators to a committee to make plans for a meeting open to all Minnesota ground spray operators April 19 in the conference room of Coffey Hall, University Farm School.

The five are Jim March, Cambridge, secretary of the committee; Lowell Schuler, Welcome; Bud Nelson, Duluth; Bernard Koll, Minneapolis, and Paul Gustafson, St. Paul.

By organizing into an association, the ground spraymen hope to provide a faster interchange of the techniques of their work as well as creating conditions for faster "movability" of group members into areas which require heavy and immediate spraying.

An example would be the 1954 armyworm infestation in the Red River Valley and northwestern Minnesota counties. That emergency demanded that, in order to save the crops, several million acres of cropland be sprayed within a few days.

Stauffer Expands New Jersey Plant

NEW YORK — Stauffer Chemical Co., New York, recently completed an expansion of its Bayonne, N.J. plant for manufacturing, processing and formulating insecticides. The expansion program included the installation of additional units to increase the air milling capacity of the plant as well as a modern unit for the formulation of liquid insecticides.

Work Starts on New G.L.F. Plant

BIG FLATS, N.Y.—Construction a new $1 million fertilizer plant he for the G.L.F. Soil Building Servic has been started by the Fertiliz Engineering & Equipment Co. Green Bay, Wis.

G.L.F. is scheduled to start oper tions in the new plant about the en of the year.

According to James E. Madiga president of the Green Bay firm, th plant will be designed to produce hig quality granular fertilizer and wi incorporate adequate facilities fo storage of both bulk and bagge finished products.

Washington Fertilizer Company Has New Plant Under Construction

EPHRATA, WASH.—Natural Fe tilizer Corp. will invest $100,000 putting a mixing plant into operatio here, Harry Hill, sales and servic representative, announced recently.

The firm expects to have the plan in production within 45 days in warehouse leased from the city at th Ephrata Air Port. Ephrata, count seat of Grant County and headquar ters for the Bureau of Reclamatio project, has taken over many of th government built warehouses on th World War II bomber training bas

Mr. Hill said the firm will mix a types of fertilizer using calcium ca bonate as a base. The firm has min near Pateros, Wash.

Nitrates, phosphate, potash, su phur, zinc, boron and other materia will be added at the plant to me requirements of specific farms or di tricts as determined by soil analys in the firm's laboratory, Mr. H said. The products will be distribute to retailers under the trade name Chief Joseph.

Over 45,000 Acres In Arkansas Sprayed With 2,4-D in 1954

LITTLE ROCK—More than 45,0 acres and about 293 miles of railroa telephone and other rights-of-w were sprayed by 2,4-D or 2,4,5- during 1954, according to reports fil with the Arkansas State Plant Boar

Of this total, 32,662 acres we sprayed by plane and 12,491 acr were sprayed by ground equipmen No reports are required for ha spraying. Most of the spraying, 3 262 acres, was on rice.

J. Drake Watson

J. Drake Watson Appointed to New Penn Salt Position

TACOMA—J. Drake Watson, recently was transferred to Pennsylvania Salt Manufacturing Company of Washington's Tacoma headquarters offices as assistant to agricultural chemicals manager.

Mr. Drake was formerly district manager for Penn Salt's agricultural chemicals at Montgomery, Ala., before Korean recall to active duty as an infantry major. A World War II veteran, he served one year in Korea.

Upon returning, he assumed duties as district sales manager, agricultural chemicals for North and South Carolina with offices in his hometown of Florence, S.C.

A graduate of Clemson College and Virginia Polytechnic Institute in agricultural sciences, Mr. Drake served with the Virginia Agricultural Experiment Station at Norfolk, Va., and the PeeDee Agricultural Experiment Station, Florence, S.C., before joining Penn Salt in 1948.

Industrial Chemical Production Shows Gain in January

WASHINGTON—Production of several important industrial chemicals during January was higher than the December output, the U.S. Department of Commerce announced recently.

Synthetic anhydrous ammonia led the gains with a production boost of 7%. Production in short tons and percentage changes are shown below.

	Jan. 1955	Dec. 1954	Pct. change
Ammonia, synthetic anhydrous	270,363	253,687	+7
Ammonium nitrate, original solution (100% NH_4NO_3)	192,595	183,915	+5
Nitric acid (100% HNO_3)	210,277	199,140	+6
Phosphoric acid (50% H_3PO_4)	272,553	*204,317	+3
Sulfuric acid (100% H_2SO_4) (gross)	1,311,644	1,299,530	+1

*Revised.

Malaria Control Project in Formosa to Continue

WASHINGTON — Foreign Operations Administration March 15 announced the signing of an agreement for United States Aid, a government agency of the Republic of China, to extend the cooperative malaria control project in Formosa, now entering its fourth year.

The 1955 objective of the project—the second island-wide coverage with DDT residual spray—calls for a contribution of $41,000 from FOA funds to finance procurement of insecticide spraying equipment.

FOA also announced a $2,550 authorization to Lebanon for procurement of agricultural pesticides. Ending delivery date is April 30.

Pesticide Use Seen in New Itaconic Acid

NEW YORK—Large scale commercial production of itaconic acid by a fermentation process using low cost carbohydrate sources was announced here March 15 by Chas. Pfizer & Co., Inc. One of the application possibilities for the new material is production of a chlorinated endo-methylene type insecticide, the company says.

John E. McKeen, president of Pfizer, said that the firm is planning a "vigorous, stepped-up industrial chemical program" with itaconic acid being the first product of the new industrial chemical series.

Production of the insecticide is still speculative, a company spokesman told Croplife, but supported by research evidence, it is expected that the insecticide can be produced by dielsalder reaction between chlorinated aromatic compounds and itaconic acid.

Pfizer is hopeful of producing more effective compounds which are less toxic to humans, he said. "At this time we have no insecticide to sell," he said, and he indicated it was too early to make any definite statement until the value of the insecticide was determined.

Itaconic acid has no "as is" use in agriculture, but its end use would be as a "chemical building block" in manufacturing useful products such as insecticides for agriculture.

A significant feature of the large scale production of the acid by Pfizer's economical fermentation process is the fact that sugar beets and sugar cane are sources utilized. The newly developed process will utilize annual agricultural crops, the spokesman said, instead of drawing on natural resources as in the petrochemical industry. He estimated that one pound of itaconic acid could be produced from two or three pounds sugar or sugar equivalent.

Mr. McKeen, in making the announcement of Pfizer's chemical program, said "the firm's chemical research division also has found other significant chemicals which can be manufactured by fermentation." These will be introduced on a planned and sustained basis, he said.

Production Started By Freeport Sulphur At Louisiana Mine

NEW ORLEANS — Freeport Sulphur Co. has begun production of sulfur at a new mine in the swamplands of Louisiana, the company has announced.

The mine, known as Chacahoula, is located near the town of Thibodaux, 50 miles west of New Orleans. Its development is part of a $25 million expansion program involving four new mines with a combined productive capacity of more than three quarters of a million long tons per year.

Other new Freeport mines are Garden Island Bay at the mouth of the Mississippi, Bay Ste. Elaine, a marine operation in the marshlands 40 miles south of Chacahoula, and Nash, a small property in Texas. The company also operates two other mines, Grande Ecaille in Louisiana and Hoskins Mound in Texas.

Florida Consumption

TALLAHASSEE, FLA.—Fertilizer consumption during January in Florida totaled 149,750 tons, according to the Florida Department of Agriculture. This included 112,002 tons of mixed fertilizer and 37,748 tons of materials.

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What About the Dollars That Go Into Fertilizers?

Editor's Note: This article is from a talk by Dr. W. H. Garman, agronomist, American Plant Food Council, Inc., Washington, D.C., before the recent Vincennes, Ind., Wheat Improvement and Soil Fertility Conference.

The cost-price "squeeze" on farmers is the subject of much discussion these days. Not only the growers themselves, but many others whose work is related to agriculture, are concerned with the implications of this situation.

In studying ways and means of overcoming the squeeze, the use of fertilizer as recommended by agricultural experiment stations comes into view in an important way. It is appropriate, therefore, that we review the major reasons why fertilizers are so essential to present-day farming.

The unbalance between the prices farmers receive for their produce as compared to what they pay for essential goods, brings about the situation called the "squeeze." According to figures recently released by the United States Chamber of Commerce, based on USDA indexes of prices, the level of prices received by farmers declined 22% during the three-year period ending December 31, 1954. During this same period, the prices paid for commodities and services, and including interest, taxes and labor, declined only 2%.

According to USDA estimates, the gross farm income in 1951 was $36.9 billions, whereas in 1954, it was $34.1 billions. Production expenses respectively in these years were $22.4 billions and $21.6 billions. The realized net income in 1951 was $14.5 billions and in 1954 was $12.5 billions. This amounts to a decline of $2 billions, or 14%.

As is well known to all who follow trends in agriculture, we have for the past couple of decades been going through a period in which farm size is increasing. The total number of farms is decreasing at a corresponding rate. This marks a trend toward more efficient farm size units.

As in industry, agriculture is also constantly striving for increased efficiency. In some sections of the country, the average size of a farm is still too small to gain high efficiency of production, especially where mechanization is required. These farmers usually are the first to feel the squeeze of any unfavorable price situation.

The purpose of this article, however, is not to discuss what is taking place in the way of shifts in farm size or in farm population, but rather to consider the very important role which fertilizers play in the agriculture of today.

To illustrate how acre yields are related to cost of production, here is an example, from the state of Wisconsin. Two of the more successful farmers in that State, Wilbur and Walter Renk, have for a number of years kept accurate records on their hybrid seed corn production, in cooperation with the agronomy department of the University of Wisconsin.

On a 55-acre field, in 1953, they averaged 169 bu. an acre. The plant population was 19,000, and the sum of $28 was spent for fertilizers. Their total cost of growing and harvesting each acre was $95.44. In this figure was $30 an acre for land rental, and all other costs up to the crib. This corn cost the Renk brothers $.56 a bushel to produce.

On another field, where they spent $18 for fertilizers, the yield was 117 bushels. On this field the cost of production was $.88 per bushel. Without any fertilizer, they raise 80 bushels of corn per acre. This corn costs them $1.25 per bushel.

In 1954, on this same 55-acre field, and with a $31 expenditure for fertilizers, the Renks produced an average of 182 bushels of corn per acre at a cost of 49¢ per bushel. That is cheap corn in anybody's language.

That is what is meant by reducing costs per unit of product produced. Without fertilizer, the per bushel cost of corn is high. By application of the proper amount, the cost is low. What other tool does a farmer have that will do this sort of job for him?

Of course, he has to employ other sound practices to farm efficiently. But there are many farmers who follow recommended practices of rotations, weed and insect control, and so on, who do not fertilize as recommended. Are they getting proper returns on their other good practices?

Once more the Renk brothers' corn crop gives an illustrative answer. Where all practices were the same, except for fertilization, yields were 80 bushels as contrasted to 169 bushels, with respective costs of $1.25 and $.56 per bushel.

That's simple, isn't it? They spent $28 for fertilizer and reduced their bushel cost by $0.69 a bushel. At the same time they produced 110% more corn on each acre. On 55 acres that meant 9,295 bushels of corn instead of 4,400.

In case they did not want to produce that much corn, just think how many acres less they would have to plant and harvest! Instead of planting 55 acres to get 4,400 bushels, it would be necessary to plant only 26 acres, less than half as much land. The saving for every unplanted acre is at least $35.

Another example of this nature comes from the state of Illinois. The results upon which this example is based were obtained from detailed cost data collected on central Illinois farms in 1951. Production costs for farmers raising 50 bu. corn an acre were compared with those of farmers on similar soils raising 90 bu. an acre. Included were such items as interest, taxes, labor, machinery, seed, fertilizer, and miscellaneous charges for management and general farm expense.

The total cost per acre, at the 50 bushel level, was $47.75, while that for the 90 bushel level was $67.25. With corn valued at $1.50 a bushel, the profit for the former group of farmers was $27.25 an acre whereas the 90-bushel producers averaged $67.75 profit an acre! The cost of growing a bushel of corn in the two instances was respectively $.96 and $.75.

The only major difference between the two groups of farmers was seen in the expenditure for fertilizers. The 50 bushel farmers spent an average of only $3.50 an acre for fertilizer, while the latter group averaged $15.00. Thus, this one item accounted for $12.50 of the increased production costs of $19.50, spent on the higher yielding farms. This included $2 more for labor, a like increase for machinery, $.50 for seed, $.75 for general farm expense, and a $1.25 increase for management.

Although a little more seed was used, and perhaps the management was somewhat better, it is obvious that fertilizer was the ingredient that made most of the difference between the two groups of farms. The added investment of $12.50 was responsible for most of the increased returns of $40.50 per acre. That is more than

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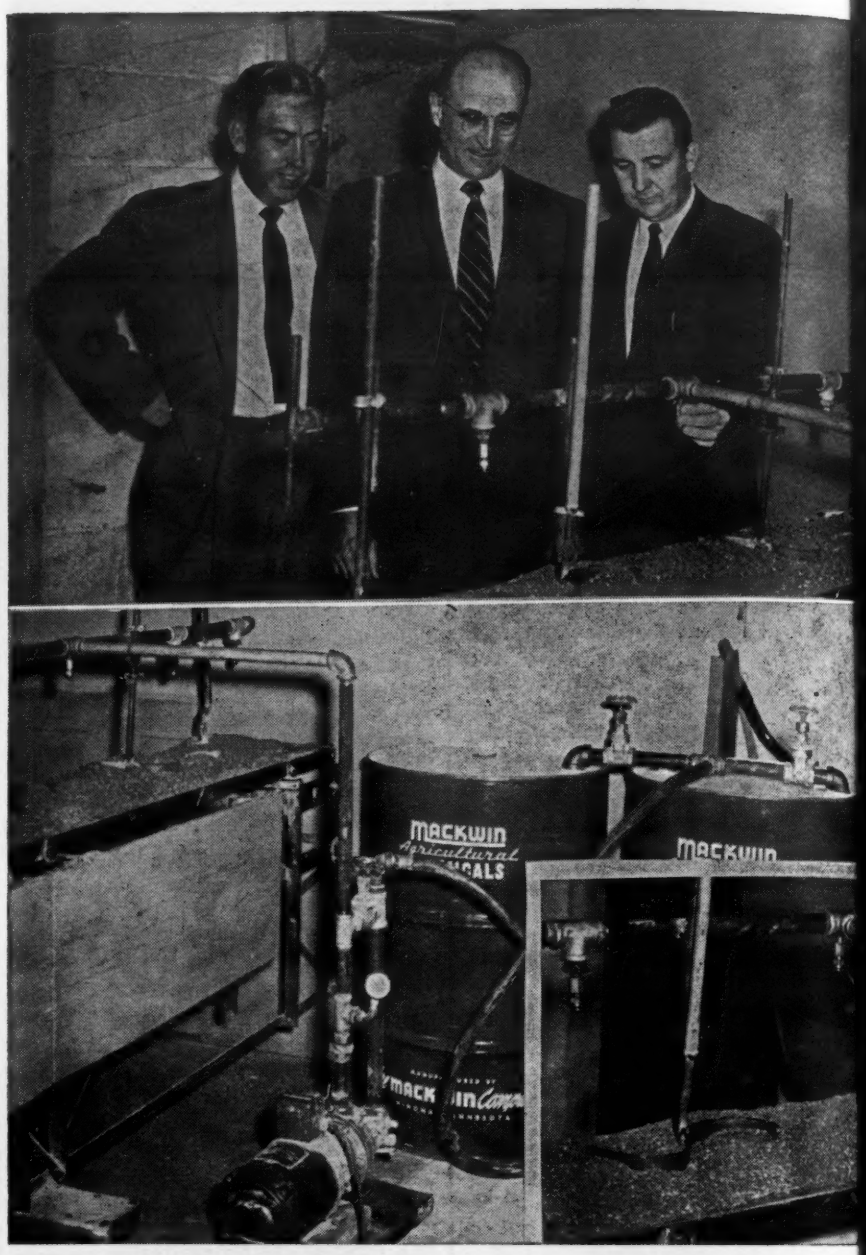


INSPECTING INSECTICIDE APPLICATOR — Top photo, left to right William T. Lemmon, sales manager, Mackwin Co.; James McConnon, vice president, McConnon & Co., and E. M. Billings, central states sales supervisor look over device that sprays calibrated amounts of insecticide on granular fertilizer moving along conveyor belt. Lower photo shows the electric pump pressure gauge, by-pass valve and arrangement of insecticide tanks in place for operation. Inset at lower right shows closeup of two nozzles and "S" shaped device for deflecting and turning fertilizer so that subsequent spray will reach all particles of the moving fertilizer.

Firm Develops Mixing Method For Fertilizer, Liquid Pesticide

WINONA, MINN.—Fertilizer mixers, getting more and more pressure from their customers for combinations of NPK with various pesticides, are definitely in the market for ideas about how this can be accomplished with the least trouble all around.

Likewise, an increasing number of pesticide manufacturers and formulators, seeing in this trend a greater market for various toxicants, particularly soil insecticides, are devising ways and means to develop these potentialities.

The Mackwin Co., a subsidiary of McConnon & Co., Winona, Minn., has made considerable headway in this direction through offering a package deal to granular fertilizer mixers who wish to include soil insecticides in some of their products.

According to William T. Lemmon, Mackwin sales manager, the service angle has proved successful in many cases; so much so that the company's salesmen are devoting a considerable portion of their time in this work.

Mackwin takes over the entire responsibility of making arrangements for the fertilizer manufacturer's entry into the pesticide-plant food business. Each installation is a custom job, with drawings being made of the general layout of the plant; its capacity per minute and per hour calculated, notations on the grades of fertilizer made; and the type of equipment taken into consideration.

Armed with complete data about the concentration of pesticide to be mixed with the fertilizer, Mackwin then attends to registering the product with federal and state agencies, gets approval on copy for labels and cooperates in other ways in taking the burden off of the client.

Heart of the actual machinery for introducing liquid pesticide into the fertilizer is an adjustable nozzle sprayer which sprays calibrated amounts of liquid insecticide (aldrin) on the fertilizer material as the fertilizer passes along a conveyor belt. Deflectors are placed along the belt in such a way as to agitate the dry fertilizer as it moves along, thus permitting the second nozzle to apply aldrin to a new area of fertilizer. Three or more "S" shaped deflectors and a like number of nozzles are used in the process.

Determining the rate of spray to obtain a desired proportion of insecticide in given quantities of fertilizer is a neat mathematical problem which has now been thoroughly licked, Mr. Lemmon says.

Known quantities include the number of pounds of fertilizer that pass along the belt each minute plus the known output of the nozzles under steady pressure. Armed with this information, it is not difficult to determine that 3 gal. aldrin to a ton will result in a fertilizer containing .5% actual pesticide.

Earlier experiments to introduce

(Continued on page 18)

Increase in Membership of Fertilizer Safety Section Urged at Southern Conference

NEW ORLEANS—With an emphasis on practical information regarding safety program, the Fertilizer Section of the Southern Safety Conference met at the Jung Hotel here Feb. 28 and March 1.

The meeting was attended by safety representatives of many fertilizer companies in the south as well as some visitors from northern states.

Vernon S. Gornto, Smith-Douglass Co., Norfolk, Va., past general chairman of the Fertilizer Section of the National Safety Council told the group that 18 additional companies have become affiliated with the NSC since the group's meeting in October and that the three-year program adopted by the Section last fall, is moving ahead satisfactorily. He urged the continued cooperation of every company represented at the meeting and encouraged all to work toward increasing the Fertilizer Section's membership.

"It is most important that we get every fertilizer company we possibly can to enroll in the NSC and to work actively toward the reduction of accidents in the fertilizer industry," he said. "Any company can greatly improve its own safety record and greatly reduce the cost of workmen's compensation insurance premiums by supporting an active and successful accident prevention program within its own organization. Top management may sometimes not be too impressed, merely by the reduction of the accident frequency rate, but all are impressed by any sizeable reduction in the cost of insurance."

"It is important that our companies who are safety minded and who do have a good safety record in their own plants, enlist the cooperation and give support to an accident prevention program in the plants who do not now have a program," he explained.

Harold R. Krueger, production manager of the Snyder Chemical Co., Topeka, Kansas, discussed ways and means for a small plant to maintain a workable safety program. He said that one of the first things that must be done toward achieving a safe working program in any plant, is to become safety conscious.

Once having this mental faculty, it is not difficult to transmit these ideas and intentions to others working in the plant. He said that management has the know-how to institute and carry out a safety program just as it had the original idea and ability to set up a fertilizer manufacturing plant in the first place.

Since smaller plants usually cannot afford the services of a full-time safety director, it is then normal to assume that the owner or operator personally supervises many of the operations. He then is the top man in a small plant safety program.

"Being a business man," Mr. Krueger went on, "his first question is, 'What does it cost and what are the returns?' when it is recommended to him that a safety program should be launched in his plant. It thus becomes advisable to take a look at the costs involved."

These costs, according to Mr. Krueger, involve those of both time and money. In the case of time, he pointed out, this will of course vary with the individual and also how determined he is about making the program succeed. "If a person desires to be safety conscious (and he must be in order to sell the program all down the line) it requires no more time to think of a safe way to perform a task than it does to think of a careless way," he declared.

"It takes but a few seconds more to instruct a foreman or worker to perform a task safely than to just issue the order for work to be done. Every time you walk through the plant, observe how the men are working in regards to safe practices.

"Look especially for slipshod methods and careless attitudes. Take a few extra seconds to inspect machinery for danger points that might be provided with guards. Insist on good lighting and good housekeeping. A few extra minutes a day will do the job, and also impress upon the workers that you, personally, are sold on safety."

As to the cost in money for a safety program, Mr. Krueger declared that the returns for the reduction of accidents are so great that it is almost absurd to think about the costs. "A few dollars for machinery guards, replacing some worn steps or dangerous ladders, a few extra lights and a couple of good brooms will do wonders for your plant," he said, then added that an expenditure of $25 per year for a membership in the fertilizer section of the National Safety Council covers up to 99 employees, and presents an opportunity to attend the annual safety congress in Chicago.

Mr. Krueger said that although some of the returns to be derived from a safety program are somewhat intangible, such as the satisfaction one gets from operating a business in which people can find safe, healthful and happy employment, there are also many actual measurable benefits.

Among these, he pointed out, are returns in increased production due to greater efficiency of workers; returns in decreased maintenance costs due to more care being exercised in use of equipment; returns in reduced premiums of compensation insurance due to rates being based on lowered accident frequency; returns in less shrinkage of saleable materials due to better housekeeping and returns in overall morale of the worker due to better working conditions.

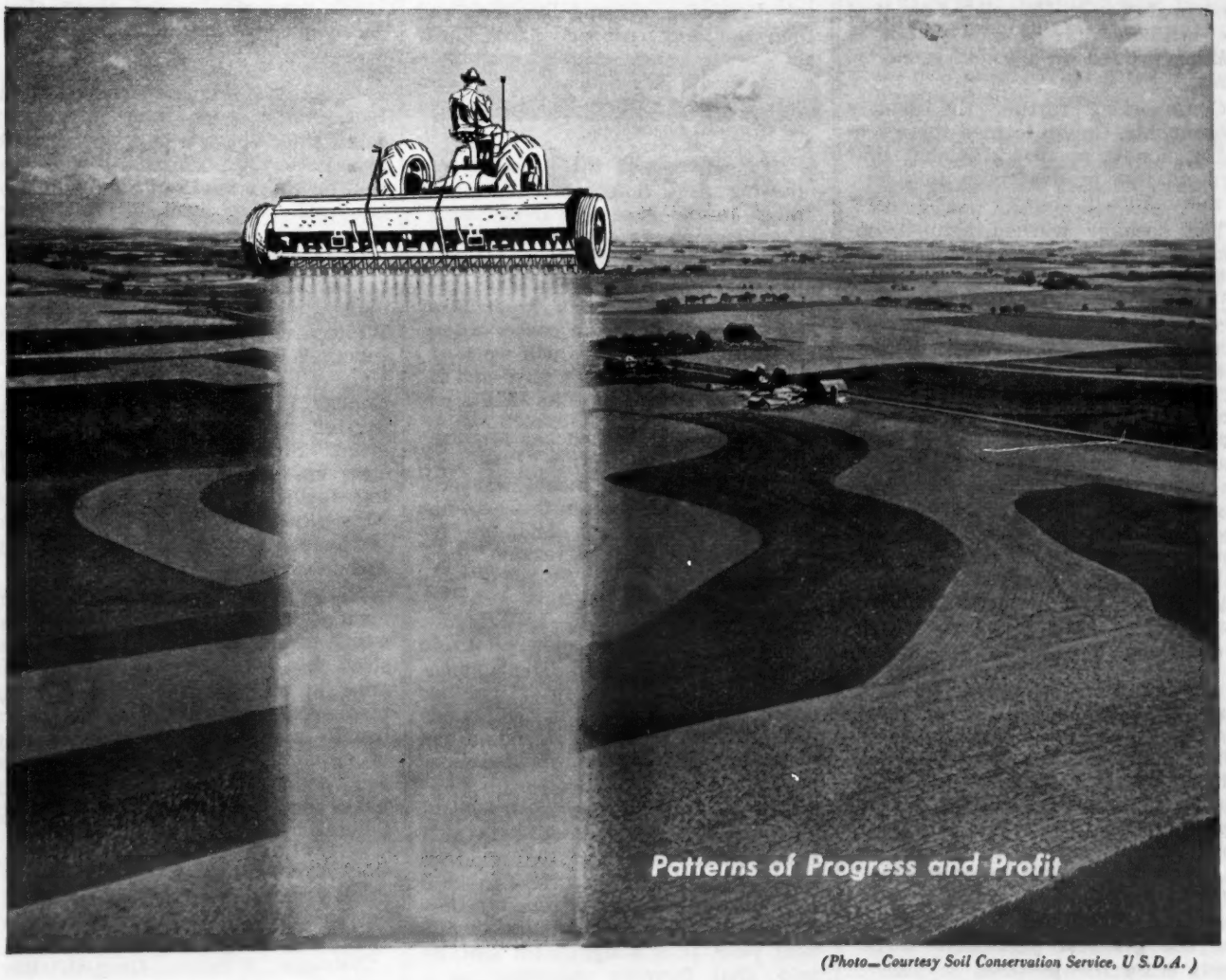
He declared that top management must first want the program, because they are the ones who must head it up. Tools required to build the program comprise only three: time, a little money and men.

To implement the program, Mr. Krueger said, management should make one person responsible for the carrying out of the program. An effort should be made to educate the workers, regular safety meetings should be held, contests arranged between departments and use made of films and pictures. Proper safety equipment should be at hand at all times, and safety inspections should be made regularly. All accidents should be reported and investigated to prevent recurrence, it was stated.

Farm Chemical Meetings Scheduled in Missouri

COLUMBIA, MO. — A series of agricultural chemicals meetings is being conducted in Missouri in March and April. According to Stirling Kyd, University of Missouri extension entomologist, they are open to anyone interested. They start at 8 p.m.

Those still to be held will be at Clinton March 29, Mt. Vernon March 30, St. Joseph April 4, Chillicothe April 5, Kirksville April 6 and Mexico April 7.



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NITROGEN SOLUTIONS GROUP

(Continued from page 1)

the construction of tanks. Then, because it was necessary to store the solutions in metal containers unsuitable for this type of material, liquid nitrogen was tagged as an excessively corrosive material.

Mr. Colvin indicated that this idea was not entirely fair since the material can be stored easily if it is done in proper types of containers. "You can't carry gasoline in an egg basket, but this is no reflection on the gasoline," he said. "Handled properly, nitrogen solutions are not difficult to take care of at all," he said.

The third limiting factor in the development of nitrogen solutions pointed out by Mr. Colvin was in the lack of equipment for application. This was a bad situation which resulted in the improvising of all kinds of "Model T" rigs which did the job in a rather crude sort of way at first. Evolution is rapid now and equipment is no longer a limiting factor. "There are plenty of rigs that will do the job," he said. Mr. Colvin continued by saying that the dealers in this business are men of courage and vision. Were it not for these dealers, he said, "we would not be here today."

The sales manager noted that when solutions people enter the field they tend to stay in it. He pointed out that the business started slowly, but is gaining ground on a sound economic basis.

Commending further the dealers present, Mr. Colvin termed them "reliable, honest people." He said that farmers like to deal with this type of merchant.

The speaker warned against operating what he called a "super market" business in which no one tries to do any selling. He said it is a mistake to sit and wait for business. Honesty, sincerity and aggressiveness were listed as prime requisites for a successful dealership. "The person who expects to remain in business for a long time must keep in mind that he will have to face the farmer, his customers, next year and the years to come," Mr. Colvin declared. He also warned his listeners against what he termed "split interests," that is, handling too many lines. This creates a dangerous situation, he said, because it is impossible for a dealer to emphasize everything.

One of the best selling tools is the establishment of a demonstration plot, using a check plot to convince the farmer customer that the nitrogen being used is of great value. "The demonstration idea is by far the best," he said. Farmers are always reluctant to accept "new ideas" but the demonstration of the work nitrogen solutions will do on a farmer's own land is by far the greatest persuasive force there is for this purpose.

Mr. Colvin urged his dealer audience to hold local meetings with the farmers. "Good speakers are usually available in any community," he said. These would include the county agent, Vo.-Ag. teachers and others who can present both entertainment and factual material. At these meetings, literature can be handed out and the serving of coffee and sandwiches can give the meeting a festive air.

Selling Ideas

Other selling ideas included direct mail, advertisements in local newspapers, and particularly, photographs of successful plots. The latter can be used in newspaper advertising, he suggested, and do a very convincing job of selling.

C. V. Condor, of the Condor Farm Management Co., Lafayette, Indiana, showed a series of slides on the screen picturing various pieces of equipment and tips on their use in his talk entitled "Shop-Built Machines and Simple Methods of Application."

Mr. Condor warned that sometimes soil insects, such as the corn root worm, are actually to blame when it appears that the application of nitrogen may have failed to produce the kind of crops expected. He showed pictures of infested roots which had been destroyed by the soil insects and explained how the plant had been badly damaged through these depredations.

In his talk, "Soil Fertility and Balanced Farming," John Falloon, extension's specialist in soils, University of Missouri, Columbia, discussed the farm unit approach which he said means balanced farming. This concept focuses attention on the family and its needs. It puts emphasis on the family objectives.

One family might have a good farm and another a poor one, but each family needs approximately the same amount of money for running expenses. It is necessary therefore to formulate different means of planning. This involves many considerations, he said, including the type of land, labor available, and the natural resources involved. It also involves organization of the farm business, the selection of crops and livestock and then building properly for those things that are selected. A blueprint should be made of long term plan, making sure each thing fits in the over-all objective.

He emphasized the necessity of putting first things first in planning. In the case of conservation, should emphasis on this be at the expense of high production at the present? This makes a big difference, he said. High production should come first and conservation is secondary. Farmers will work at conservation only if it pays and if they have the money to handle it.

"This point is where fertilizer comes into the picture," he said. "Heavy fertilization means less erosion in corn fields after the corn has had a heavy growth and the resultant heavy cover of residue."

Good Practices

Good practices can snowball to do the best good, he said. The application of fertilizer and water together on cotton made a gain of 550 pounds compared to only 400 pounds when water and fertilizer were added separately.

The use of fertilizer acts as both cause and effect, he pointed out. Upon using more fertilizer, better crops are grown which gives the farmer a better income. This, in turn, encourages him to buy more fertilizer the next year. It is a significant fact, he said, that farmers operating on a balanced economy are using from four to five times the amount of fertilizer than others who operate on a more haphazard basis.

The use of nitrogen alone, however, was pointed out by the Missouri agronomist as being inadequate on the long pull, important as nitrogen is. The other elements of phosphate and potassium are necessary to make the balance more complete. He compared nitrogen to the gasoline used in an auto on a long trip and the other two elements as the supply of lubricating oil.

"When one starts out on a trip, the gas and oil are both in adequate supply," he said. "But as the trip goes on, it is necessary to replenish the gasoline more frequently than the oil. That is the way it is with nitrogen as compared to the other fertilizer elements."

At a luncheon on Monday, Dr. Harold Myers, associate director of the Kansas Agricultural Experiment Station, Manhattan, spoke on "Research and The Nitrogen Fertilizer Industry." He emphasized that the entire fertilizer industry of today owes its existence to the curiosity of research scientists down through the years of the past.

He said that research is an attempt to get new information on the laws of nature and there are at least three ways of accomplishing this: First, by ordinary, hard, critical thinking. Second, he said, by chance observation and critical interpretation of things thus noted. In other words, the ability to see things that are out of the ordinary. Third, by planned experimentation, in which one takes the variables, observes results, and then interprets what has happened. The facts are then separated from fiction and conclusions are made.

Research History

Dr. Myers reviewed some of the history of how fertilizer research has come about. In primitive times, he said, someone with a curious mind noticed that benefit could be derived from the placing of manure on farm lands and that rotation was helpful particularly when legumes were used.

Later, discovery of nitrogen, phosphorus, and potassium, as elements was a fundamental one and enabled further progress to be made. Dr. Myers emphasized again that "curiosity is the thing that accomplished this achievement."

So long as the industry depended upon natural occurring supply of nitrogen, its scope was necessarily small since there was a very limited supply. He then pointed out the steps that had been taken to combine nitrogen with other elements, finally arriving at the method of synthesizing ammonia in 1901.

The Monday afternoon program, under the chairmanship of John White, Auburn, Nebraska, heard two talks. Wilbur Ringler, agronomist, University of Nebraska Agricultural College, Lincoln, spoke on "Soil Testing for a Balanced Plant Food Program." Showing colored pictures on a screen, he pointed out the soil testing facilities of the University of Nebraska, emphasizing the care and meticulous attention paid to doing this job.

He said that no fertilizer recommendations should be made without a soil test of some kind and emphasized the necessity for having this done in an adequate and scientific manner. He said that three weeks are usually required for the processing of a given soil sample but the results are "bound to be right" after they have gone through the University's laboratory.

A lively question and answer period developed as part of the talk given by Arthur Arnell, Shell Chemical Corp., on the subject of "Nitrogen Solution Compatibility with Insecticides and Weed-killers." Mr. Arnell said that not much work has been done on finding out all the answers regarding the combination of weed killers with fertilizers, but a great deal is known about the use of insecticides with fertilizer materials.

In the first place, he said, directions for the application of both fertilizer and insecticides for the control of soil insects, are timed to coincide which makes the combined application a natural thing to do. He said that aldrin and BHC, for instance, fall into this category.

He quoted a statement by Dr. George C. Decker to the effect that average crop yields can be increased at least 10% by the elimination of the soil inhabiting pests. He also quoted Dr. John H. Lilly of Iowa State College regarding the tremendous increase of soil insecticides in the state of Iowa. The number of acres so treated has grown from 10 acres in 1951 to a total of 362,500 acres in 1954, he stated.

There are some problems existing regarding formulations and emulsifiers, he said. He advised his listeners to make a simple test of emulsibility by mixing small amounts of insecticide with the nitrogen solution to see how the two will work together. He warned the dealers not to mix insecticide and fertilizers and allow them to stand for many hours. If left standing for a long period, such as over night, it would be necessary to agitate the emulsion in order to put it back into workable shape.

Regarding safety, the Shell entomologist reminded his audience that insecticides are poisons and should be recognized as such. However, with sensible handling, and the observance of simple precautions, there should be no particular danger involved. He reminded that many millions of pounds are used each year without casualties and that if normal precautions are used there should be nothing to worry about.

One of the questions put to Mr. Arnell regarded the corrosive action of the insecticide. He replied that they are relatively non-corrosive and that this is not a serious factor for consideration.

Another questioner asked whether the use of insecticides with fertilizer would tend to kill soil microbes and earthworms. Mr. Arnell replied that earthworms are very tough creatures and that at recommended dosages they would easily survive. Soil microbes are not injured by the application of insecticides in this manner.

Effect on Microbes

Another query regarded the amount of insecticide that might be lost in dry fertilizer if left stored for some time. Mr. Arnell assured the audience that very little loss of insecticide has been experienced in tests made with granular material stored in a bag.

A banquet Monday evening was presided over by Merrill Langfitt, of radio station KMA Shenandoah, Iowa. Mr. Langfitt introduced to the audience the speaker of the evening, John Strohm, associate editor, "The Country Gentleman."

Mr. Strohm spoke on the subject, "Agriculture Behind the Iron Curtain," and backed up his comments by showing 45 minutes of movies in color, which he had taken in Russia shortly after World War II. Mr. Strohm indicated that these pictures were entirely uncensored, he having taken them out of the country undeveloped.

As a sidelight to this, Mr. Strohm related how he was allowed to enter Russia and travel many thousands of miles within its borders taking pictures of farming activities. The movies were eloquent of the country's primitive methods of raising food and Mr. Strohm said that propaganda from behind the iron curtain about widespread advances in agriculture development are probably largely untrue.

Financing

Tuesday's program was presided over by Bill Abel, Tarkio, Mo., solutions dealer. Marion Murray of the Chillicothe State Bank, Chillicothe, Mo., discussed some of the problems regarding the financing of fertilizer programs. The bank he represents is thoroughly sold on the value of fertilizer financing, he said. This has been proved over the past several years by the institution's aggressive program of promoting fertilizer sales.

The community served by the bank has benefited to a marked degree by this activity, the banker reported, and fertilizer loans are looked upon by the bank as being one of the best types of business

(Continued on page 17)

Special Retail Section

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The Mainspring of Selling

EDITOR'S NOTE: A good salesman's selling power comes from within—from the mainspring—according to Russell W. Varney, Varney Associates, New York. This article is an excerpt from a talk Mr. Varney delivered at the recent seminar sponsored by Hilton & Riggio, Inc., in New York.

Business goes forward by salesmanship.

Some one has said that men and motor cars go forward by a series of explosions. A motor car cannot fulfill its function without a series of internal explosions and a salesman cannot make anything of himself until he gets a few explosions in the mixing chamber of selling.

However, both the motorcar and the salesman need plenty of help and assistance.

But what about cost?

What do you pay for when you buy a car? Is it metal, motor, color, wheels? Not at all—you buy and pay for power. That power is delivered only when you supply the gas, oil, water and the spark.

Now what do you pay for when you buy a salesman? Is it hands, feet, blue eyes? Not at all. You are buying power—selling power delivered only in full measure when you supply product, selling aids and confidence.

In the case of a car, the driving power comes from within. We call it the motor and you get riding performance in the degree you supply the elements of motivation—not one but several. The spark is the most important—for that creates the action.

In the case of salesmen, selling power comes also from within. You may call it confidence. Some call it faith, others, selling drive, and you get selling performance in the degree you supply the spark that activates the salesman to positive action.

Two Directions Are Open for Salesmen

The salesman can only move in two directions. He either goes forward or he goes backward, depending upon the route he follows. Like his direction, he can follow only one or two routes: the positive route or the negative route.

The interesting fact is that the route he follows is purely a result of his thinking, and his thinking rflects his thinking, and his thinking reflects his training.

The regrettable part is not the fact that in far too many instances he chooses the negative route, but that he does not receive adequate positive thinking guidance.

What is meant by adequate guidance? Stop to consider the number of prospects, customers, and business associates the salesman contacts who daily load him with negative thinking as compared to the amount of basic fundamental positive thinking supplied by his superiors. Chances are that it would be a 100 to one shot, so he's thinking negatively rather than being a positive thinker.

One big difference between a leader and a follower, a "doer" and a "don'ter" is that one thinks positive and one thinks negative. Many leaders have one-track minds

(Continued on page 14)

Do Your Salesmen Ride in All Directions?

Russell W. Varney, in the accompanying article, poses some meaningful ideas for those who hire and train salesmen. They are summarized here:

1. As a salesman thinks, so goes the sale.
2. Promotion can't do the salesman's job.
3. Salesmen can be frustrated by "selling tension."
4. A poor salesman costs as much as a good one.
5. Salesmen think in pictures, not in words.
6. Negative-thinking salesmen don't sell.
7. Sales meetings are not the same as pep meetings.

SHOP TALK

OVER THE COUNTER

FOR THE DEALER

By EMMET J. HOFFMAN

Remember the list of questions that was popped at you when you went to your banker and got the loan for your business? Or when you bought that little yellow rambler on the hill for your wife and kids?

The next time you have a chat with your banker friend, reverse the procedure and do a little questioning yourself, not for the purpose of embarrassing him, but for quite another reason. Find out how much your banker friend—and his staff—knows about the potentiality of fertilizer. He might surprise you—either by how little he knows about fertilizer or how much he is aware of its potentiality of creating wealth.

Many bankers don't know about the merits of fertilizer because no one has bothered to tell them and the banker hasn't taken the time to learn for himself. That's where the dealer can step in.

Some Questions

Does your banker know that fertilizer pays dividends two ways: (1) By creating immediate additional profits for farmers and (2) by building and conserving soil for future generations.

That may be high sounding talk but a banker is also realistic. A bank can prosper only as its clients prosper. In your chat you might let your friend know that not only is he interested in the farmer's prosperity but that you—the fertilizer dealer—are also interested in seeing him make money.

Remind your banker that the Agricultural Commission of the American Bankers Assn. recommends that a bank have available the service of an agriculturally-trained man to help and advise farmers on improving management practices and fertilizer is one important phase of improved practices. Many banks already have such service.

Soil Test Method

Ask your friend if he knows the procedure a farmer should use in getting his soil tested, because a proper soil test is essential in prescribing how much and what kind of fertilizer should be used. If your friend isn't certain, don't let a day go by without schooling him on this important step. The county agent will be glad to help and your agricultural college has all the necessary information.

Does your friend know what work is accomplished by, and what are the functions of the county agent, soil conservation technicians and vocational agriculture teachers?

By all means get the banker friend interested in fertilizer demonstrations this year. Arrange to have him go with you to farms and fill in all details concerning these check plots. Let him see for himself what fertilizer and the other farm chemicals can do.

Sound Loans

Let him see for himself how losing operations can be made profitable and delinquent loans converted into loans of good standing. Make sure he understands that fertilization properly used in conjunction with other desirable practices can create the basis for sound loans and increased income.

Naturally, a banker should not, and will not encourage all farmers to purchase all the fertilizer—any fertilizer — they can obtain. Not every fertilizer loan is a good loan and that fact must be accepted. In fact, improperly used fertilizer can actually lose money for the farmer and such a situation is not healthy either for the dealer or banker.

If you have a banker that is aware of all these factors of your business, you have a valuable ally indeed. If he isn't aware, you have a job cut out for yourself.

Remember there are many farmers with the "know-how." They have found out (by testing their soil) what their soil needs to produce maximum yields.

They know it can't be done on sour soil. Sour soil is akin to sour people.

Train your listening ear to agricultural research and you can better advise your farmer customers (and gain new ones). What a team—county agent, dealer, farmer.

It's time to spread 500 to 1,000 lb. 5-10-20 per acre on the permanent pasture of orchard grass, or brome and Ladino clover.

I already know you are handling the purest seeds available. Keep in mind, for spring seeding, more farmers seed too late rather than too early.

You might mention to customers that oats and barley like potash. Cotton likes to eat, too, and it's nothing for farmers to produce a ton of tobacco per acre.

But did you know that much tobacco will eat about 150 lb. nitrogen, 25 lb. phosphorus and 210 lb. potash. Also remember that spuds are not timid when they get to the plant food table . . . 300 bu. of these babies will eat 155 lb. N., 40 lb. P_2O_5 and 200 lb. K_2O.

Keep a big chart on the wall showing the amount of plant nutrients each crop contains.

It takes 40 lb. P_2O_5 and 178 lb. K_2O to produce four tons of alfalfa. If the farmer expects to produce 75 to 100 bu. corn he'll need to apply from 800 to 1,000 lb. of a 10-10-10 plant pusher plus an extra 100 lb. nitrogen as a side dressing—some areas need more, some less.

Idea of the Week—Install a rain gauge in back of your business place for the farmers' information.

73 Maryland Corn Club Farmers Make 100 bu.

COLLEGE PARK, MD.—A total of 285 Maryland farmers have completed corn club projects in the three years they have been organized, and 73 reached the goal of 100 bu. or more per acre.

Figures for 1954 show that 21 of the 38 farmers enrolled in corn clubs produced more than 100 bu. per acre, in spite of an unfavorable growing season. Although membership was down from the previous two years, the percentage of farmers making 100-bu. yields was higher than in 1952 or 1953.

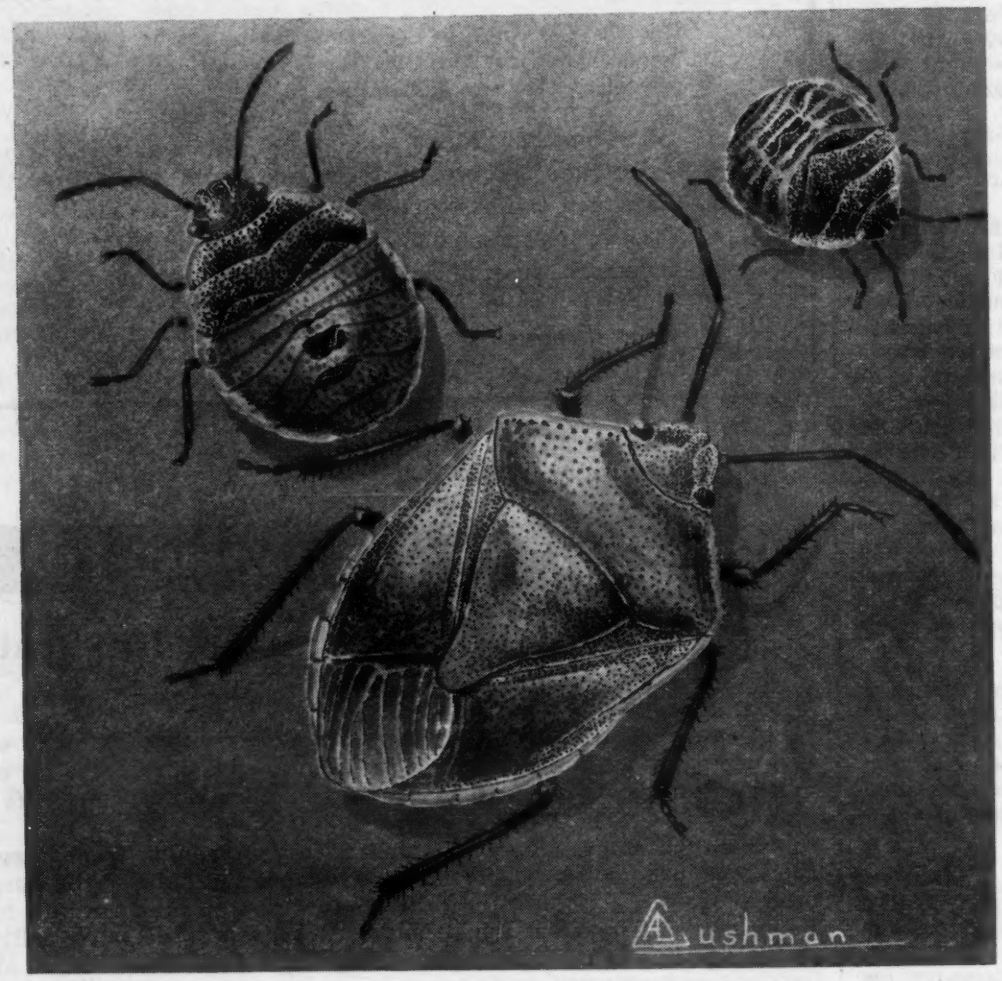
The highest yield yet made by a corn club member was also recorded in 1954. Joseph H. Layton of the Dorchester County 100-Bushel Corn Club, had a yield of 160 bu. per acre.

Better Selling
Richer Sales Fields for Dealers

BUG OF THE WEEK

Mr. Dealer--Cut out this page for your bulletin board

Stink Bug



How to Identify

Several species of stink bugs do damage of economic importance. The one shown above, the Conchuela, has a yellowish edge around its body. In the center is shown the adult of the species; at the left, the 4th stage nymph and at the right, the 3rd stage nymph.

Damage Done by Stink Bug

Several species of this insect damage alfalfa severely. They suck the juices of the plants thereby stunting and deforming them. They damage the seed heads of alfalfa and reduce the amount of seed that could be harvested otherwise. Full seed crop potentials cannot be realized unless the pest is controlled. Other stink bugs attack and severely damage cotton in all areas where it is grown. They feed largely on bolls and seldom invade cotton fields in large numbers until the plants are fruiting. They insert their needle-like beaks into the bolls and suck the juice from the immature seed. These punctures may cause the shedding of young bolls. Small bolls become soft, turn yellowish and fall off. Punctured bolls not thrown off by the plants, may show injury varying from a slight stain in one lock of the mature boll, to what is termed an "unpickable" boll, or one in which every lock has been punctured.

Habits of Stink Bug

Eggs of stink bugs are laid in the stems of plants. These eggs hatch into small, rounded, blackish nymphal stink bugs that lack wings. Within three or four weeks, they develop into full-grown stink bugs, capable of laying more eggs. There are usually several generations each year. Adults of the last generation spend the winter under leaves and trash on the surface of the soil.

Control of Stink Bug

Both sprays and dusts have been variously recommended for control of this pest. Toxaphene in either form at the rate of 6 lb. an acre, technical, will give control; chlordane 1 lb. an acre, dust or spray; ½ lb. actual heptachlor in 100 gal. water an acre; BHC, 3% gamma isomer plus 5% DDT and 40% sulfur; a dust containing 15% toxaphene plus 5% DDT and 40% sulfur may also be used at the rate of 10 to 15 lb. an acre. USDA says that two treatments with sprays made from emulsion concentrates have given effective control; BHC to give 0.4 lb. gamma isomer an acre and BHC 0.3 lb. gamma isomer plus 0.75 lb. DDT an acre are likewise effective.

Drawings of Stink Bug furnished Croplife through courtesy of Hercules Powder Co., Wilmington, Del.

Previous "Bug of the Week" features are being reprinted in attractive 24-page booklet, priced at 25¢ single copies; reduced rates in quantities. Write Croplife Reprint Dept., Box 67, Minneapolis 1, Minn.

Better Selling

Richer Sales Fields for Dealers

FARM SERVICE DATA

Extension Station Reports

"Underprivileged" pastures can be rebuilt to profitable, high yielding levels by good soil management methods, according to Dr. G. E. Smith, University of Missouri agronomist. He points out that pastures are "the most neglected of all farm crops."

An investment in pasture improvement on low yielding fields can pay big returns, according to Mr. Smith.

"College experiments and results under practical farm conditions have indicated that hay yields can be increased from less than one ton per acre to more than six tons by soil building measures including the applications of high nitrogen fertilizer," he says.

Increasing attention is being given to the use of nitrogen along with phosphate and potash to keep a proper balance of grasses and legumes in the pasture growth, he declared.

★

Oak wilt is endangering West Virginia forests. It now exists in twenty-eight counties. If adequate control measures are not undertaken, the disease may spread to all oak-growing areas of the state, according to West Virginia University.

Research in the control of oak wilt is conducted by forest pathologists at the West Virginia University Agricultural Experiment Station. Other agencies working to control the disease are the State Conservation Commission, which surveys forest lands and locates diseased trees, and the State Department of Agriculture, which destroys the diseased trees.

Although the spread of oak wilt in West Virginia has not been rapid, foresters point out that effective control methods must be developed and practiced so that oak wilt does not destroy oak forests in the same manner that chestnut blight destroyed the valuable chestnut forests in West Virginia.

★

Milk producing costs can be cut anywhere from 20 to 25% by using good forage to replace grain in feeding your dairy herd. That is the statement of U.S. Department of Agriculture dairy specialists.

These specialists recommend that good forage should make up about 70% of the total feed for each milk cow. They point out that grain feeding of dairy herds has increased 25% since 1947. This had added greatly to the cost of producing milk.

When cows are fed more high quality forage and less grain, milk is produced at lower cost. This lower cost can mean higher profits per cow and per acre.

Agronomists estimate that pasture production could be increased three to four times by improved management methods. Such methods, they say, should include liming, where needed, the use of fertilizer, well-adapted legume-grass mixtures and good grazing management.

A soil test can be a guide in helping determine what ratios and amounts of fertilizer to use for profit-building pasture growth. Once the stands are well established, they can be maintained by regular top-dressings of phosphate-potash fertilizer.

★

As far as crops are concerned, good soil structure can mean the difference between high yields and low yields. It can help determine, too whether or not farmers get top efficiency from every pound of fertilizer they use.

Dr. R. B. Alderfer, Rutgers University agronomist, reports that tomato yields were increased about nine tons per acre, when 1,200 lb. 5-10-10 fertilizer was added to soil with improved structure. Sweet corn yields were boosted more than two tons and lima beans about 1½ tons.

The same amount of fertilizer was added to soil with poor structure that produced the lower yields.

Crops in the well-structured soil made greater and better use of plant nutrients. The roots, stalks, leaves and harvested portions of tomatoes grown on such soil contained 283 lb. nitrogen, 90 lb. phosphate and 520 lb. potash. Tomatoes from the other soil contained 187 lb. nitrogen, 60 lb. phosphate and 345 lb. potash.

Soil with good structure is mellow and porous. It is easier to work and make a seedbed. It doesn't lump or crust over. Air and water can easily get in. Internal drainage is good. Roots have more room to develop and reach out for the nutrients and moisture. Seedlings can push up more readily.

Building and maintaining good soil structure involve adding regularly to the soil's active organic matter supply. This can be done by (1) growing well-fertilized soil-building legumes regularly in the rotation and plowing them down; (2) returning all available crop residues and adding fertilizer where needed to speed rotting; (3) returning all available farm manure, adding fertilizer to crop residues such as corn stalks when they are turned under.

★

Green Pastures programs for New England will start their eighth consecutive year in 1955. Activities will get underway in late March or early April, reports Winston Way, Vermont extension agronomist.

Since its start in 1947, the idea has broadened from a pasture contest into a year around roughage program.

Big Tomato Yields

NEWARK, DEL.—The use of good cultural practices by tomato growers in Delaware last year enabled many farmers to produce good yields in spite of the extreme drouth, according to Robert F. Stevens, Delaware extension horticulturist. The use of good cover crops like rye and crimson clover, manures, adequate fertilizer and a complete disease and insect control program were important factors in producing high yields of tomatoes.

BEAIRD ANHYDROUS AMMONIA EQUIPMENT

Since the introduction of anhydrous ammonia as a commercial fertilizer, Beaird engineers have worked closely with the industry to develop special equipment for handling this nitrogen-rich liquid fertilizer. Behind the Beaird line of anhydrous ammonia equipment is the experience of thirty-six years in manufacturing pressure storage vessels for the petroleum and chemical industries.

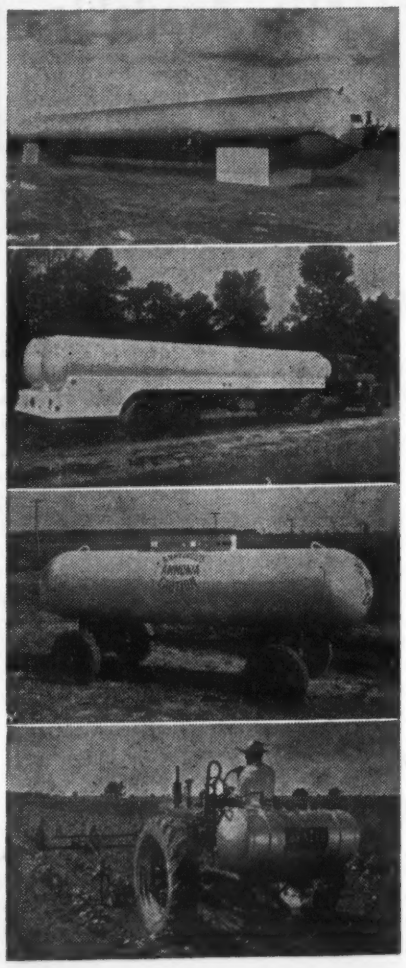
PACKAGED STORAGE INSTALLATIONS

Available on "Turn-Key" or "Install-it-yourself" basis

Now you can install bulk storage for anhydrous ammonia as a complete packaged storage plant. You may order it as a "Turn-Key" job or on an "Install-it-yourself" basis. On "Turn-Key" jobs the entire installation, including all assembly and final inspection, is handled by Beaird service engineers. On "Install-it-yourself" installations, a Beaird service engineer is available for supervision after tank has been located on foundations and is ready for piping.

Packaged storage plants may be installed with one or more tanks of the following sizes: 2,000, 3,000, 6,000, 12,000, 15,000, 18,000 or 30,000-gallon. These tanks are manufactured in our Shreveport factory and tested by X-Ray. Piping is pre-assembled to simplify field work.

Plant layout is planned to fit your individual needs and the entire installation engineered to meet state and code regulations.



PACKAGED STORAGE STATIONS—3,000, 6,000, 12,000 and 15,000-gallon. This patented Beaird development is delivered complete, ready to operate. Includes integral steel pontoon type foundations and all necessary fittings, pump or compressor and safety controls.

TRAILER TRANSPORTS—twin-tank 5,400-gallon transport. Mounted on heavy duty tandem axle assembly. Smartly designed and finished in white enamel over primer coat.

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APPLICATOR TANKS — for mounting on applicator unit or tractor. Made in following sizes: 110, 150 and 200-gallon. Available unfitted or fitted with highest quality fittings. Finished in white enamel.

Let us quote you on your requirements for anhydrous ammonia equipment.

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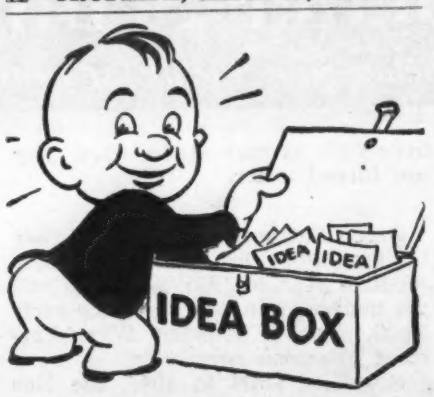


What's New...

In Products, Services, Literature

You will find it simple to obtain additional information about the new products, new services and new literature described in this department. Here's all you have to do: (1) Clip out the entire coupon and return address card in the lower outside corner of this page. (2) Circle the number of the item on which you desire more information. Fill in your name, your company's name and your address. (3) Fold the clip-out over double, with the return address portion on the outside. (4) Fasten the two edges together with a staple, cellophane tape or glue, whichever is handiest. (5) Drop in any mail box. That's all you do. We'll pay the postage. You can, of course, use your own envelope or paste the coupon on the back of a government postcard if you prefer.

No. 6222—Sales Program

The Agricultural Sales Division, Chas. Pfizer & Co., Inc., has available a dealer program for promoting sales of its product, Agri-mycin, an antibiotic spray powder for control of certain plant diseases such as fire blight of apples and pears. The program is outlined in new literature prepared recently and which is now available. A broadside details the program to the dealer and a catalog sheet outlines the product and various program angles, also at the dealer level. Also available is a small folder for consumer distribution and a large booklet which contains abstracts on the use of antibiotics in the treatment of plant diseases. To secure more full details of the program check No. 6222 on the coupon and mail it.

No. 6210—Tank Trailer

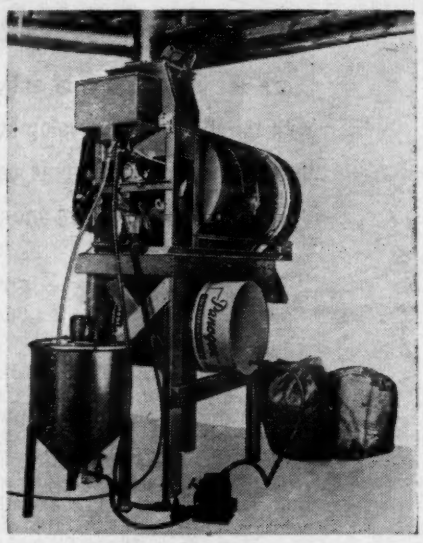
Descriptive literature on its anhydrous ammonia tank trailer has been made available by the Foreman Manufacturing Co. Tank specifications listed on the literature state: 1,000-gal., 265 PSIG 300° F. maximum tanks—either 41 in. or 46 in. diameter tanks. According to a company spokesman, the tank trailer is designed to insure compliance with applicable ICC regulations, with a tank mounting which facilitates tank removal. The literature lists specifications of the trailer chassis, axle assembly, tires, brake system, coupling, fenders, safety chains, lighting and dimensions. Secure more complete information by checking No. 6210 on the coupon and mailing it.

No. 5114—Bagging Scale

The Richardson Scale Co. offers a product data sheet on its improved GGG-38 bagging scale. This mechanically-operated weighing unit has been equipped with a synchronized belt feeder and a pneumatic inlet-gate assist, both of which enable it to operate faster, handle lumpy materials and weigh down to 25 lb. Besides a detailed description of the scale, the data sheet includes lists of seven specifications and five features. Included also are a photograph of the unit and a dimensioned engineering drawing. To secure product data sheet No. 5401 check No. 5114 on the coupon and mail it.

No. 5119—Slurry Adapter

Panogen, Inc., now is marketing a slurry adapter for use on its present seed treaters. The addition of the slurry adapter presents a quick method of change-over from liquid seed treating to slurry treating and takes in a greater range of seed treating, it is claimed. A completely automatic unit, it incorporates an overflow feature for uniform suspension of the chemical in the slurry mixture. The company announcement states: "This feature, along with an accurate measuring device, delivers the slurry, properly mixed at the exact dosage rate, to the seed—insuring most effective seed treating. The slurry tank pumps dry to avoid waste. The treater is self-cleaning, permitting quick change-over to liquid seed treating." To secure more complete information check No. 5119 on the coupon and drop it in the mail.



Send me information on the items marked:

☐ No. 5119—Slurry Adapter	☐ No. 6215—Herbicide
☐ No. 5114—Bagging Scale	☐ No. 6216—Fertilizer Film
☐ No. 6205—Bulletin	☐ No. 6217—Chemicals Handling
☐ No. 6206—Gauges	☐ No. 6218—Applicator
☐ No. 6210—Tank Trailer	☐ No. 6219—Catalog
☐ No. 6211—Weed, Grass Killer	☐ No. 6220—Soil Fumigant
☐ No. 6212—Bag Handling	☐ No. 6221—Rootworm Folder
☐ No. 6213—Lawn Fertilizer	☐ No. 6222—Sales Program
☐ No. 6214—Brochure	

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COMPANY .....

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Also Available

The following items have appeared in the What's New section of recent issues of Croplife. They are reprinted here to help keep retail dealers on rotational circulation informed of new industry products, literature and services.

No. 6205—Bulletin

Harnischfeger Corp. recently issued its revised grab bucket crane bulletin. Several of its 24 pages are devoted to suggestions on selecting the proper type of grab bucket crane for a specific service. Features of the unit with large pictures and text, are included as are clearance dimensions. The bulletin is departmentalized to show grab bucket cranes in various services, with a spread of pictures showing modern fertilizer plants. The bulletin may be obtained by checking No. 6205 on the coupon, clipping and mailing to the address provided.

No. 6211—Weed, Grass Killer

A non-selective weed and grass killer has been announced by Chipman Chemical Company, Inc. This new product is called Chlorea and, is claimed to kill all types of vegetation. It is a non-separating combination of sodium chlorate, borate and CMU—chlorate for deep-rooted weeds with the prolonged soil-surface action of CMU on shallow-rooted grasses and annual seedling growth. The company announcement states: "It also has a lasting residual effect to inhibit re-growth. Chlorea is non-poisonous and, because of its borate content, does not create a fire hazard when used as directed. It can be applied dry or used as a water-mixed spray." Further information and literature may be obtained by checking No. 6211 on the coupon, clipping and mailing it.

No. 6221—Corn Rootworm Folder

Designed to tie in with the current Velsicol Corp. "Kill Corn Rootworms" campaign in the corn producing areas of the nation, a new corn rootworm quiz folder for dealers and customers alike has been published. Touching on important phases of corn rootworm control from "What are corn rootworms?" to "What are the essential requirements of a corn rootworm insecticide?", the 19 questions and answers in this quiz show how Heptachlor insecticides are used in the control of this pest. These folders, with space for imprinting name and address, may be secured by checking No. 6221 on the coupon and dropping it in the mail.

No. 6219—Equipment Catalog

The Gotcher Engineering & Manufacturing Co. has available for free distribution its 1955 anhydrous ammonia equipment catalog. The company's line includes field applicating equipment including tractor mounted, semi-mounted and pull-type ammonia applicators. To secure the catalog, check No. 6219 on the coupon and mail it.

No. 6220—Soil Fumigant

Larvacide Products, Inc., recently announced a new addition to its line of ethylene dibromide soil fumigants sold under the trade name, Nemex. The new addition, Nemex-85, is a formulation of ethylene dibromide containing 83% by weight toxicant. The control of nematodes and certain other soil-borne pests in infested soils with the new product is said to improve root development and vigor, increasing resistance to drouth and certain wilt diseases. Good results are claimed on infested soils on such crops as tobacco, cotton, peanuts, vegetables, ornamentals, and even in peach orchards when used as a pre-planting site treatment. For literature check No. 6220 on the coupon and drop it in the mail.

No. 6216—Fertilizer Film

The Spencer Chemical Co. has produced a 16 mm., 27-min. color movie called "George Tackles the Land" and is accepting bookings for future showings without charge. The film stresses fertilizer usage for corn, cotton, citrus groves, celery and pastures. Information about showing the film may be secured by checking No. 6216 on the coupon and mailing it to this newspaper.

No. 6215—Cotton Herbicide

Geigy Agricultural Chemicals has announced a new herbicide for cotton. Designated as Geigy 444, the compound is 2-chloro-4, 6-bis-(diethylamine)-s-triazine. Excellent results as a pre-emergence and post-emergence herbicide, in directed as well as overall applications are claimed. Rates as high as 24 lb. per acre have been applied as pre-emergence treatments without phytotoxic effects. Directed and overall post-emergence

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sprays, applied at a rate of 12 lb. of the product per acre produced no reduction in growth. Slight burning resulted from overall applications. Successful tests on other crops, including lima beans and peas, have been made, with varying control of nutgrass, broadleaved weeds and annual grasses being obtained. For further information and experimental quantities, qualified research personnel are invited to check No. 6215 on the coupon and drop it in the mail.

No. 6213—Lawn Fertilizer

Smith-Douglass Company, Inc., has introduced its new plant food, called by the trade name of Nutro plant food pellets, in southeastern U.S. The product is pelletized and homogenized (see photo) and literature describing it states that it is clean, dustless and odorless. Formulated with the home gardener in mind, it

can be used spread by hand or with a spreader. It is not necessary to rake or wash down the fertilizer, it is claimed, since the pellets bounce off the leaf to the ground. It is packaged in 10, 25, 50 and 100-lb. bags, and comes in two forms—regular or instant. The instant from dissolves in water, and can be used for foliage and root feeding. In liquid form it can be sprinkled on leaves for foliage feeding, poured around the roots as a starter, or sprayed on large areas. Instant Nutro, it is explained, can also be used in the dry form. Also being manufactured is Nutronite, an all organic (animal waste) fertilizer with 9% nitrogen. To secure literature describing these products check No. 6213 on the coupon and drop it in the mail.

No. 6212—Bag Handling

Arkell & Smiths is offering a 10-page bulletin on "Palletizing Filled Multiwall Bags." Based on laboratory tests and field checks, and complete with detailed drawings, the bulletin contains useful ideas and suggestions to facilitate handling, shipping, and adapting bags now being used, to fit a given pallet. Copies of the bulletin may be obtained by marking No. 6212 on the coupon.

No. 6206—Gauges

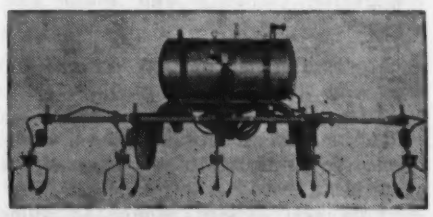
Two new gauges have been added to the Marsh Instrument Company's line of agricultural ammonia instruments—one graduated 0-60 lb. and the other graduated 0-150 lb. Both gauges are standard with 1 lb. primary divisions and are designed for use on metering devices. Other gauges manufactured are 0-400 lb. and 0-300 lb. for bulk plant installations and also two compound ranges—30 in. x 150 lb. and 30 in. x 300 lb. A new feature now available is the recalibrator for recalibrating a gauge. Secure more complete information by checking No. 6206 on the coupon and mailing it.

No. 6214—Fertilizer Brochure

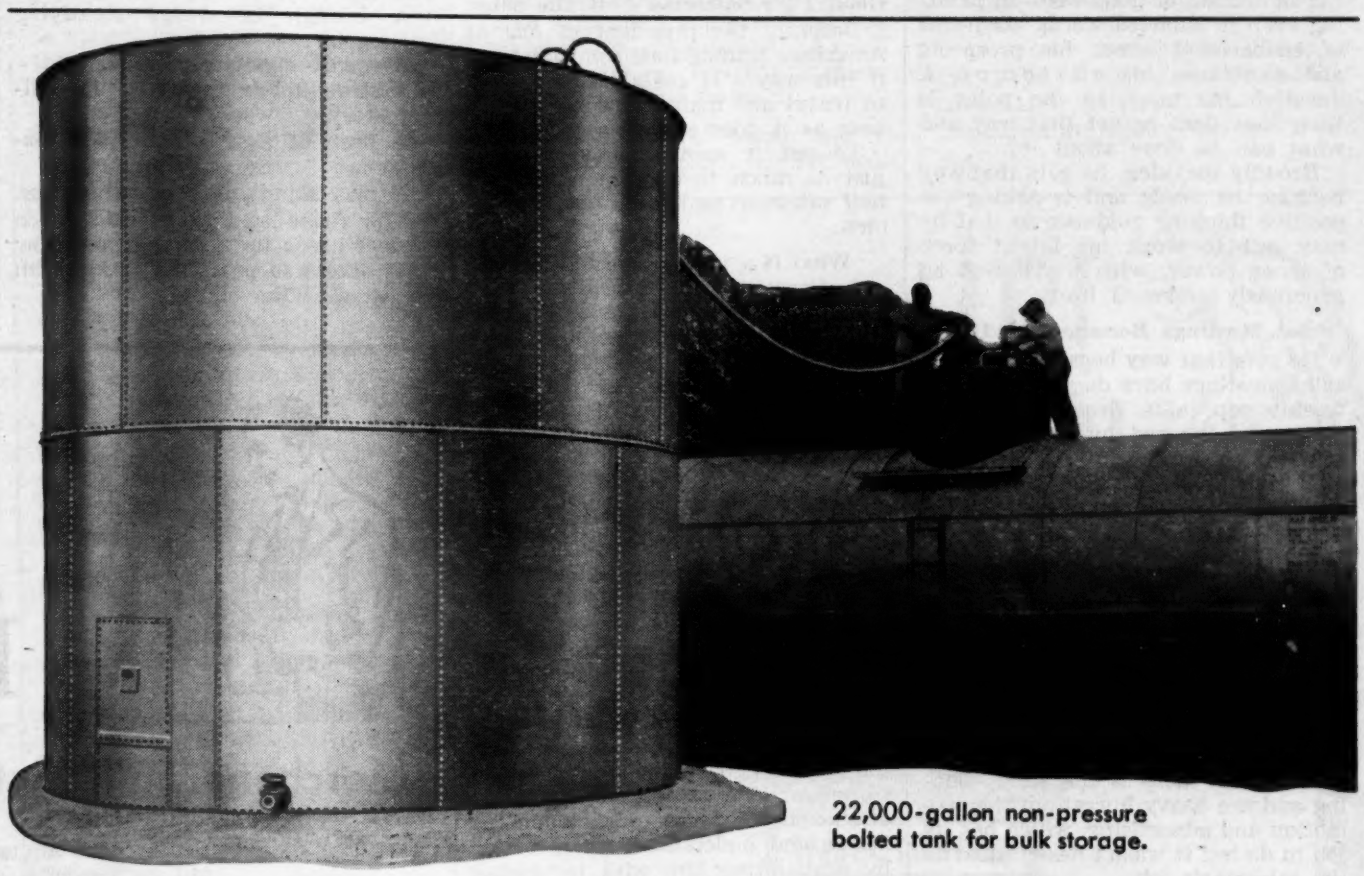
A new brochure entitled, "Make Bigger Profits with USS Ammonium Sulphate," has been published by United States Steel Corp. The color brochure presents a breakdown by crops (corn, oats, wheat, barley, rye permanent and supplementary grass and apple and peach trees) with recommendations for quantities of ammonium sulphate per acre, method of application, when to use and various suggestions for its use. Sections are devoted to fall application of fertilizer and returns possible through use of the company's product on pastures and small grains. Check No. 6214 on the coupon, clip and mail it to secure the brochure.

No. 6218—Applicator

A new PTO operated liquid nitrogen applicator for applying pressure or non-pressure solutions is being manufactured by Spra-White Chemical Co., Inc. It can also be used for insecticides and herbicides, as it is available with boom or boomless nozzles for broadcast application, company spokesmen said. From 10-200 lb. of nitrogen per acre may be applied and up to 80 acres may be covered in a day, used before planting or while side-dressing, it is claimed. Application depths up to 6 in. and positive mounding of earth over the

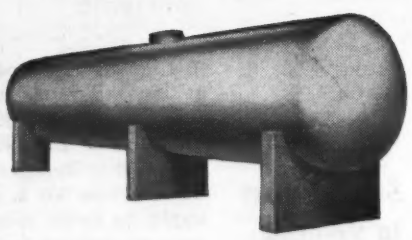


nitrogen are specified. The 200-gal. tank is equipped with calibrated sight glass and 30 lb. psi working pressure is possible. To secure more complete details check No. 6218 on the coupon and drop it in the mail.



22,000-gallon non-pressure bolted tank for bulk storage.

BUTLER offers 3 ways to profit from liquid nitrogen bonanza



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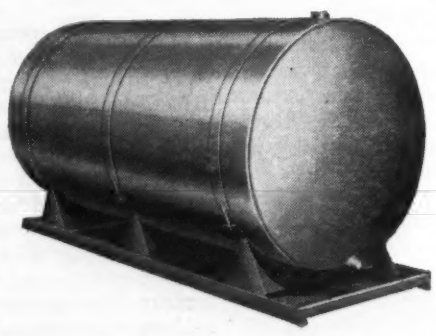

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Better Selling

Richer Sales Fields for Dealers

MAINSPRING OF SELLING

(Continued from page 9)

and they, by utilizing their inner power, build up an immunity to negative thinking and make the grade.

Most salesmen, on the other hand, like the "beggar on horseback" jump on the promotional band wagon and ride in all directions, trying with negative thinking to arrive at a positive result.

This you cannot escape—a salesman sells as he thinks—and many directing salesmen think they think when they think.

What does a salesman think anyway?

This I cannot answer because of the limitation of good taste in printing even in subdued words his terms of endearment about his prospects and sometimes his customer. A question far more to the point is this: How does he get that way and what can be done about it?

Broadly speaking, he gets that way because he needs and is asking for positive thinking guidance so that he may put to work his latent force of inner power, with which God so generously endowed him.

Sales Meetings Become Pep Talks

He gets that way because too many sales meetings have degenerated into weekly pep talks, dreaded by managers and ignored by the salesman and which occur in this manner: "All right boys, let's get going! You guys know we've got the best, the biggest, the greatest, so get out there and tell 'em! Now listen, all you flatheads, I've told you I want results, not alibis. Another thing, we've got a quota and don't forget it. Put your shoulder to the wheel and push, no more leaning on it. You can do it, I know you haven't, but we can't let the chief down." And so it goes—and goes.

Then too, there is the stem winding and the heavy hurrah on the promotion and advertising, which has its job to do but it wasn't designed to do the salesman's job.

This negative thought is not the fault of sales meetings or advertising presentations. This negativeness is the result of winding up the salesman's spring of selling so tight that he just can't move. He's like a good watch with a mainspring wound so tight it can't run until someone with knowledge triggers it and releases the tension.

Selling Tension and Evil Results

Such a situation creates selling tension and it has been well proven scientifically, and I'm sure you've proved it to yourself that under tension, far too little is accomplished and most deadly to selling is the fear it instills.

The overwound salesman with no trigger is much like the soldier with a gun and no ammunition standing "face to face" with the enemy. That is frustrating.

Smothers Confidence

Selling frustration not only retards daily progress but, worst of all, it stifles and smothers confidence, that vital force of inner power. Selling frustration is the heart disease of selling, coming from within, and if it does not kill the sale, it most assuredly cripples it.

Fortunately, this selling sickness is a condition which can be and has been corrected in actual practice, not with merchandsing hypos or pep-talks, but by techniques of human behavior which the salesman can understand and can apply to his selling problems.

Fortunate also is the fact that the symptoms of this sales crippling ailment are readily detected, and I'm confident you'll recognize them instantly. For example:

"I've heard that stuff before."

"The dummies I have to call on."

"Look Joe, I'll tell you why it won't work."

"Aw nuts."

"It's not my fault. I threw the book at him!"

I'm sure most salesmen throw the book all right, but they fail to throw themselves into the selling arena.

These remarks came from new and experienced salesmen alike and in number they regrettably represent an exceedingly high percentage of the selling power you're paying for and not getting.

Good, Poor Salesman Cost The Same

Recently the president of one of America's leading food companies put it this way: "It costs just as much to travel and maintain a poor salesman as it does a good salesman."

To put it another way—it costs just as much to operate a force of half salesmen as it does whole salesmen.

What is a half a salesman? Half a salesman is a salesman who knows his product but not himself, who knows his selling aids and not what makes his prospect "tick," who knows how but cannot tell others how with confidence, clarity and conviction.

He is the result of management's winding his spring of selling to the tension point by putting far more in his hand than in his heart.

However, he is still the individual of whom Angelo Patri refers to when he says, "In you, before birth, was stored all the power that you will ever need to meet all the difficulties you will ever face."

That I firmly believe to be true, and the half salesman has all this inner power to make him a whole salesman. The problem is a matter of showing him how to know himself better and understand others better by acquainting him with techniques of self-motivation.

To put it simply—it adds up to giving him the trigger to release his spring of selling.

So much for diagnosis and what to do. Now we arrive at how to do it.

Two Hemispheres of Selling

The salesman's world has two hemispheres—one identified as primary salesmanship which represents what might be styled his physical field of selling; and the other called post graduate salesmanship, which represents his field of mental selling.

The field of primary selling embraces the knowledge of product supported by selling tools such as technical information, package, promotion and advertising. This field or phase of the salesman's selling process is, I'm certain, very familiar to all and it's most essential for without such knowledge and tools little could be accomplished. It is one half of the salesman's world of selling.

The remaining half of his selling world is what I like to style post graduate salesmanship, embracing knowledge of human behavior. It is in this field of his selling process that supplies the trigger that releases his spring of selling.

It is in this hemisphere of his selling world that he becomes a whole or complete salesman, learning how to exercise his inner powers and how to apply his inherent selling skills to his selling tools. These skills — to name a few—are self analysis, positive thinking, tension control and communication.

Each of these classifications have many ramifications, all of which exert influence upon his selling powers and confidence.

I would like to pose a few questions about fear. Is fear inherent or acquired? Do we become conditioned to fear? What prompts fear? How can you recognize fear in others?

When a salesman acquires the knack of self analysis, he is on the road to better handling of himself and better understanding of his prospect. What could be more important?

I shall devise a mental picture that will arouse interest in self analysis and be helpful to your salesmen as it has been to many.

This is not a physical checkup such as—did I wash my neck, comb my hair, clean my nails, shine my shoes? It's mental. It's looking inside, searching for the application of positive thinking to positive selling. Across the top we'll place these symbols:

A triangle or wedge signifying getting in.

A square signifying confidence.

A straight line signifying the selling story.

A flash of zig-zag signifying discussion.

A plus signifying repeat business.

Now strike lines downward so each symbol heads up a column and now lines across so prospects' names can be listed at the far left.

After listing your prospects, take each one and enter a check under the symbol if you feel honestly you're okay, and a zero if you're not.

The result of this analysis, if made up for yourself alone will help you bolster your weaknesses and dismiss all worry about your strong qualities.

Looking across your own personal chart, you see exactly where you stand with each prospect. Looking up and down each symbol column, you'll readily note where your strength and weaknesses are.

As a matter of fact, pictures and symbols are a rather important element in this sphere of post graduate salesmanship. I wonder how many salesmen realize that they think in pictures, not words. Pictures come first. What the salesman must do is to translate his picture thinking into words, and if he is truly selling he must paint the prospect right into his picture.

All good advertising paints the prospect into the picture, either copywise, or by illustration or both.

There's an old proverb that says, "Every one has something to sell," and many use symbols from time to time to help dramatize the selling story. Symbols crystallize thinking and bring the idea of a mental picture into sharp focus.

RINGING THE cash register

Merchandising Hints for The Retailer

Contest Time Is Here

Dealers who annually conduct growing contests, such as tall corn events, should start now to work up interest and enthusiasm among farmers. Announce details of the contest and the prize you will award in preliminary ads in your newspaper and over your radio station. Offer worthwhile prizes so that farmers will find it worth their time and effort to enter the contest. Acquaint your salesmen thoroughly with details of the contest. Such contests require a considerable time and effort investment but pay off in publicity and extra business—which mean more profit.

50% Boost In Volume

A thorough remodeling job has never failed to produce at least a 50% increase in volume and sometimes has run as high as 900%. This statement was made recently by a food merchant with 30 years of merchandising experience in speaking to fellow members of a grocers association. To a certain degree at least this claim will apply to farm stores as well since they are in the business of selling to consumers also. Building better stores is the most direct and most productive way to build a profitable following of customers. Just as car owners insist on repairing, painting, polishing, servicing and tuning up their vehicles, farm merchants should emphasize the same approach in their stores.

Watch Discounts

A discount is somewhat like the double-edge ax. It can be used to sharpen your profit picture but it may also cut your throat—financially speaking. The main purpose of discounts is to obtain more business leading to additional profits. Discounts should build a steady, profitable volume of business. Discounts must not be used as an occasional device to make a sale. The dealer who uses discounts to buy business, instead of earning it, is cutting his throat—businesswise. A discount system should be just that—a systematized, uniform method of price variations for quality purchases. It should work the same for all customers. Remember, the dealer who misuses discounts is seldom successful, but the dealer who has a profitable business seldom misuses discounts.

Don't Drive Sales Away

You can drive sales away by allowing soiled, dog-eared literature to remain in racks and on counters. Messy counters and displays reflect the dealer's attitudes of indifference to a prospect.

Better Selling

Richer Sales Fields for Dealers

Doing Business With Oscar & Pat

Oscar Schoenfeld, the frugal one in the partnership of Schoenfeld & McGillicuddy, had just settled down to the job of opening the morning's mail, when Red Bartlett, an employee, came in. "Oh, Oscar," he said, "Reeder Lumber Co. is here with a big load of planks and other stuff. Where do you want us to put it?"

The pudgy, balding partner laid down his letter opener. "Lumber!" he echoed. "We didn't order any lumber."

"Well, the driver says it's for this place," persisted Red. "You'd better come and talk to him."

So, considerably irritated, Oscar put on his coat and walked into the warehouse and out on the loading platform. Sure enough, the bright red delivery truck of the lumber firm contained a number of wide and long planks, spanking new and some saw horses, also new.

"We didn't order any lumber," Oscar snapped. "There must be some mistake."

The stocky driver shook his head. "No, just last night Mr. Reeder told me to load those planks and horses and bring them here first thing in the morning."

Oscar fumed. "I'll telephone Mr. Reeder," he snapped. "Lumber for a fertilizer plant! Huh."

"Mr. Reeder's gone to Chicago," the truck driver said. "Left about a half hour ago."

Oscar's irritation rose. He hated bungling and inefficiency, and this looked like some of both to him. Suddenly he got an idea. "Don't unload a single board," he ordered. "I'm going to telephone somebody!"

He turned and went back into the office and phoned Pat McGillicuddy, his partner. Nora, Pat's wife, answered. "Oh, hello, Oscar," she said. "Pat's just getting up. I'll call him."

Oscar covered the transmitter with his hand, and gazed intolerantly at Tillie Mason, the plumpish, nervous bookkeeper. "He's not up yet!" he intoned with biting sarcasm. "And it's 7:45! When will that fellow learn to come to work on time? He sleeps while the rest of us work. Oh—"

"Hello, Oscar, what's stirring?" asked Pat sleepily.

"Did you order some lumber from Reeder Lumber Co.?" asked Oscar, his voice trembling.

"Sure, I did. Just have them leave it in the warehouse. I'm building a special display. I'll tell you about it when I get down. I've been up late the last few nights making signs for that display."

"But all that lumber! It's new—and expensive!" Oscar could hardly keep from yelling in his exasperation.

"It's all right," Pat said. "I'll explain everything."

Oscar's face was as determined as that of a husband deciding to leave his wife after a quarrel. He hung up without another word and went slowly into the warehouse, his hands flexing and unflexing. "Put that lumber over by the office door," he ordered curtly.

Oscar stomped back into the office. "He orders lumber!" he fumed. "Brand new big expensive planks—for a display. He spends money like a drunken sailor. How can we ever make money when he acts like that? I wish—I wish—" he broke off and stared at his desk.

Tillie Mason knew what Oscar wished. He half said it so many times that she knew exactly what he meant. Each partner often wished the same thing—namely, that he could sever all connections with the other—especially when each became irritated with the other.

But each was smart enough to know that the other possessed qualities he didn't have. Each knew that together they made an excellent business team, balanced each other, just like a well balanced fertilizer makes a good crop.

When Pat came to work a half hour later, looking a little tired, he set down a packet of cardboard signs, took off his coat and hat and sat down.

"Well," said Oscar, unable to restrain himself any longer. "What kind of display is it this time?"

"One that I hope will sell more fertilizer," Pat said. "In the first place, Oscar, it will mean moving two of the islands from the center floor location and shoving them elsewhere. I want to put those planks on horses in the middle area so as to have a big display space, with spotlights on it."

"With spotlights, huh?" Oscar said glumly, his hands clenching the sides of his chair. "Gonna have some dancers, eh?"

Pat grinned and even Tillie smiled at this rare evidence of a sense of humor in Oscar, even though tinged with sarcasm.

"Not a bad idea," Pat said, "but it won't fit in here, though. We can save it for the future. Oscar, few farmers know, for instance, that when they take a 100 bu. corn crop from an acre of land they also take out 140 lb. nitrogen, 54 lb. phosphate and 135 lb. potash."

"Only a fool knows you can't grow something on nothing," Oscar commented practically.

Pat nodded. "What I want farmers to realize is how much a corn crop takes out of an acre of land, and how much they need to put back. So, I'm filling two bags with ordinary fertilizer for display purposes and wrapping some white cloth around the middle and will hang a sign on it which says 140 lb. nitrogen.

"Another partly filled sack will bear a sign which says 54 lb. phosphate and another bag and a partly filled one will say 135 lb. potash. A big sign up above will say 'This Is What a 100 Bu. Corn Crop Takes Out of One Acre of Land'."

Tillie Mason looked very interested, but Oscar looked glummer than ever.

"At another spot on the planks will be filled sacks where we will have signs saying it takes 50 lb. nitrogen, 20 lb. phosphate and 115 lb. potash to produce 50 bu. oats on an acre," Pat went on. "I'll also show how much fertilizer is required for alfalfa by the acre. That display will make farmers think."

"Will it make them buy?" Oscar asked, a little sarcastically. "That's what interests me."

"I've got another sign which tells farmers it doesn't pay to skimp on high analysis fertilizer if they want big crops. You can get a big crop every year if you put something back is my motto. And Nina and I will pretty up that display with crepe paper and spots and streamers, so that farmers won't forget that lesson."

"But the lumber," Oscar said triumphantly. "It costs a lot. You could use old lumber just as well."

Pat shook his head. "No, I talked Reeder into letting me use this lumber free of charge. We'll stack one plank up against the display, with a sign saying the planks were furnished 'courtesy of Reeder Lumber Co.' and that farmers can buy good lumber and other building supplies there."

Oscar got up and sharpened his pencil. His face was stern when he came back. "Maybe your idea will bring some extra business, and maybe it won't, but let me tell you something. You don't organize your time right, and a business must be organized.

"Each time you—you get one of these ideas, the collections suffer—you put them off. And you never set aside a time to clean that—that terrible desk." He pointed at the heaped up material on Pat's desk, then turned his shaking finger at Pat. "You're not so smart, Pat McGillicuddy!" he said. "You—you only think you are! Some day you'll find out."

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Write For PRODUCTS BOOKLET

Yankee Farmers Shift from Low to High Value Crops

BOSTON—Farmers of New England's more densely populated counties are caught in a crossfire of competition, the Federal Reserve Bank of Boston reported in its current monthly review.

But the bank added that adjustments to change are nothing new to Yankees and predicted that "they may be expected to meet this current competition successfully."

How this two-way squeeze is applied to some of the region's farmers is described in a review of the agriculture of Massachusetts' Middlesex County:

Middlesex farmers generally practice intensive types of agriculture, produce largely for immediate adjacent markets, and have many advantages over farmers in more remote areas, the bank said.

But their advantages are increasingly counterbalanced by competition from distant, lower-cost producers aided by fast refrigerated transportation facilities, and by competition for land from expanding suburban industrial and housing developments.

These two pressures, the bank reported, have forced farmers to shift from low to high-value crops.

As a result of these competitive squeezes, the Middlesex farmer has become one of the country's most resourceful operators. Of the more than 3,000 counties in the country, Middlesex is fifth in the value of nursery and greenhouse products sold and 23rd in value of poultry products sold.

The county's 829 square miles encompasses seven cities and 46 towns, with a total population in excess of 1,000,000. Yet, the farms in the shadows of these communities grew products valued in 1949 at $21,500,000.

Fertilizers Sold in Connecticut Meet High Standards

NEW HAVEN, CONN.—Fertilizers sold in Connecticut continue to meet high standards of quality, according to the report on fertilizer inspection for 1954, which has been issued by the Connecticut Agricultural Experiment Station.

The Station's Analytical Chemistry Department made analyses of 842 samples during 1954, an increase of 97 over the previous year. These samples represented 89,442 tons of fertilizer sold in Connecticut last year. The proportion of guaranties met was 88%.

Making up the largest group of samples were commercial mixed fertilizers; 223 official samples of these materials were analyzed. The proportion of these guaranties met was 86%. Phosphoric acid was the element most often deficient.

The second largest group of samples consisted of materials containing chiefly nitrogen. Of the 61 official samples examined, only three were found to be deficient.

AVERAGE APPLE YEAR

BURLINGTON, VT. — Vermont's apple growers fared reasonably well during an average production year in New England and the nation, reports C. L. Calahan, Vermont Extension fruit specialist. Estimated production in Vermont was about 880,000 bushels, or somewhat less than previous year's crop of one million bushels. According to the New England Crop Reporting Service of the USDA, New England 1954 commercial apple production totaled 6,275,000 bu. This is slightly above the 10-year average, but 20% less than the 1953 production.

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Reprints of Croplife's Feature

Bug of the Week

Twenty four of the insects described in Croplife's weekly feature, "Bug of the Week," have been reprinted into an attractive 8½ x 11 inch booklet for distribution to the trade. The price is 25c each in quantities up to 100; 20c each in quantities of 100-1,000, and 15c each in quantities over 1,000. Firms may have their names imprinted on the back cover at a moderate extra charge.

Included in the booklet are the following insects:

Alfalfa Weevil	Northern Corn Rootworm
Armyworm	Onion Thrip
Boll Weevil	Plum Curculio
Chinch Bug	Potato Leafhopper
Cotton Bollworm	Seed Corn Maggot
Cutworm	Sweetclover Weevil
Grasshopper	Tarnished Plant Bug
Imported Fire Ant	Tobacco Hornworm
Lawn Chinch Bug	Tomato Hornworm
Lygus Bug	Tuber Flea Beetle
Meadow Spittlebug	White Grub
Mosquito	Wireworm

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What's Been Happening?

This column, a review of news reported in Croplife in recent weeks, is designed to keep retail dealers on rotational circulation up to date on industry happenings.

Speakers at the Spring Meeting of the National Agricultural Chemical Assn. in St. Louis called for an extensive educational job, directed at the public, dealers, distributors and the basic pesticide industry itself. . . . U.S. Department of Agriculture surveys indicated that chinch bug infestation in 1955 would be local, ranging from non-economic to threatening.

Pesticide industry leaders, in answer to a Croplife survey, said that an improved balance between supply and demand of materials appeared likely for 1955. . . . Freeport Sulphur Co. and Pittsburgh Consolidation Coal Co. announced plans to form a new firm, National Potash Co.

Commercial Solvents Corp. announced that it will participate in a Canadian chemical project, Northwest Nitro-Chemicals, Ltd., which will manufacture and market nitrogen and phosphate fertilizers. . . . Standard Oil Company of California announced a chemical manufacturing expansion expected to cost $16 million. It will include a new ammonia and nitric acid plant.

A new firm, Diamond Black Leaf Co., was announced Feb. 24. Diamond Alkali Co., Cleveland, will acquire Virginia-Carolina Chemical Company's interest in the new firm during the next five years, according to the agreement. The new firm will be managed by Diamond Alkali. Loren P. Scoville and Dr. Bruce G. Gleissner will serve as general manager and assistant general manager, respectively, in the new firm.

A new attendance record of over 500 was noted at the Feb. 17-18 meeting of the Middle West Soil Improvement Committee in Chicago. Speakers represented colleges and universities in the 13 states involved, and included industry representatives.

The U.S. Commerce Department predicted record sales of chemicals and allied products in 1955, with gains seen in the use of fertilizers and pesticides.

Construction started on an ammonium nitrate plant to be operated by Brea Chemicals, Inc., Los Angeles. . . . International Minerals & Chemical Corp. announced that it is expanding its potassium sulfate producing facilities at Carlsbad, N.M. . . . Stauffer Chemical Co. completed a new insecticide and fungicide blending plant at Lubbock, Texas.

Procedural regulations for the establishment of safe tolerances for pesticide chemicals used on food crops are to go into effect March 6, the U.S. Department of Health, Education and Welfare announced Feb. 9.

Robert Campbell, acting president of the new St. Paul Ammonia Products Co., announced that the firm would erect a $15 million anhydrous ammonia plant near St. Paul.

Fertilizer mixers, replying to a Croplife survey on the 1955 business outlook, said a balance of supply and demand appears likely this year. The fall fertilization program was reported to be making headway in some areas.

The 1955 corn allotment was set at 49,842,697 acres, an increase of 8% over that of last year . . . Organization of Calumet Nitrogen Products Co., a new firm that will build an ammonia plant at Hammond, Ind., was announced by Standard Oil Co. (Indiana) and Sinclair Refining Co.

Sales of East German potash below domestic prices threaten to produce a loss of at least $2.5 million to the U.S. potash industry, it was stated at a U.S. Tariff Commission hearing on the imports. . . . The U.S. Department of Agriculture reported that a serious corn borer infestation is likely this year in the Midwest if weather conditions are favorable for the insect's development.

International Minerals & Chemical Corp., Chicago, announced plans for a more than $1 million expansion program for its potash plant at Carlsbad, N.M.

Regulations governing certification by the U.S. Department of Agriculture of the usefulness of pesticide chemicals as authorized under the Miller Bill were issued by USDA.

The carry-over of 26 major pesticidal chemicals in the hands of manufacturers is down about 10%, according to a USDA report issued Jan. 13. . . . A huge spraying project to control spruce budworm in eastern Canada in 1955 was announced. Some 2 million acres of timberland are due for treatment. A similar project in the western states of the U.S. was foreseen for 1955 with some 900,000 acres slated for spraying by plane against spruce budworm.

Oregon's spray and dust applicators met at Corvallis and heard talks warning against carelessness in disposing of empty containers and in handling chemicals. . . . Richard P. Porter, formerly of Ethyl Corp., was named vice president of Larvacide Products, Inc., New York.

Numerous state meetings were held. Cotton States Branch of Entomological Society of America met at Tampa, Fla. and elected H. C. Young, USDA as chairman. . . . The Southern Weed Conference met Jan. 17-19 at St. Petersburg, Fla. with 300 in attendance. G. C. Klingman, N. Carolina State College, Raleigh, was named president of the Conference.

Colorado Fertilizer Conference was held on the campus of Colorado A & M, Ft. Collins. That fertilizer can largely compensate for lack of moisture in dry years, was emphasized by speakers. . . . Mississippi Insect Conference at State College was held early in January featured well-known speakers;

More than 500 attended the Northeastern Weed Control Conference in New York. John Van Geluwe, GLF Soil-Building Service, Ithaca, N.Y., was named president of the group for 1955. . . . The pesticide trade may benefit from new emphasis on grain sanitation, John Cipperly, Croplife's Washington reporter said. Use of the provisions of the Miller Bill will help in this regard, since residual tolerances may now be set.

SOLUTIONS GROUP

(Continued from page 8)

done by the loaning institution. "Lack of credit is certainly not a bottleneck," he reported.

Bank representatives have gone to considerable ends to show farmers the economics of using fertilizer properly, he said. This program has succeeded to a considerable extent. He urged the solution dealers present to cooperate more fully with the banks in their localities in securing finances for their better type of customers.

A broad view of the fertilizer industry, past, present, and future, was presented by Kasper Peter, assistant division manager for the Phillips Petroleum Co., Omaha. He indicated that the history of fertilizer is the story of man's improvement in food production from primitive times to the present day. Progress had been extremely slow through all the centuries past until about 100 years ago when Von Leibig discovered that plants live only from inorganic substances and through the process of photosynthesis make food for themselves.

"Leibig was a practical man," Mr. Peter said. He continued his experiments by assimilating bone meal and carrying on other practices which formed a sound basis for further discoveries.

Mr. Peter pointed out the increasing need for added amounts of nitrogen in fertilizer grades. He said that the ratio was once 1-4-1 but is now up to 1-1-1. However, at this rate, we have not been able to replace the nitrogen removed from the soil in harvesting crops. Mr. Peter indicated that he is looking forward to the day when the standard ratio will be something like a 2-1-1 which he said will come much nearer being a realistic grade.

However, since such things move slowly, he remarked that perhaps the nitrogen industry has produced too much too soon, but he indicated confidence that the need for nitrogen will eventually catch up to the productive capacity of the industry today. He pointed out that Europe, too, is moving ahead in its nitrogen production program so that it will have less need for imports of nitrogen.

Procter Gull, agronomist for the Spencer Chemical Co., Kansas City, Mo., used a "flannel board" to present a technical illustrated talk on the "physical, chemical, and agronomic characteristics of nitrogen fertilizer materials." He placed on the board a number of chemical symbols of types of soil, showing how it is possible for soils not to be able to make use of fertilizer materials unless these materials are in a form which can get down into the texture of the soil.

He described the action of liquid nitrogen and pointed out how this type of fertilization operates to the advantage of the growing plant.

Bill Arnold, technical service director, Allied Chemical and Dye Corp., used a considerable number of colored slides to discuss his subject of "Solving Problems of Storage, Transportation and Application of Solutions." He pointed out that every new idea brings problems along with it, and the use of liquid nitrogen is no exception. Over a period of time, he said that aluminum has been found best suited for storage tanks so the trend in the industry is toward this material. Other metals are frequently attacked by the corrosive action of liquid nitrogen, causing many of them to be unsuitable for use.

He warned the operators against being careless with these materials particularly when it comes to welding leaky tanks. "This process is very, very dangerous unless proper precautions are observed," he said. He pointed out further that even when the tanks are empty, residue of the solution can cause explosions and the greatest care must be taken to avoid this.

He told the men present that buying a tank for storage of liquid nitrogen deserves as much consideration as that used in purchasing an automobile. He said that the tanks are valuable pieces of equipment and it is not wise to cut corners too far to save a little money on this score.

He made it clear that there is not one brand of tank that is "best" for all types of use, including storage, application, and transportation.

He said that the eventual all-purpose tank is still a "long way in the future" because the problem of corrosion is still too great.

The final program Tuesday afternoon included three speakers: John Pesek, Iowa State College agronomist; Dick Cecil, American Nitrogen Corp., Dayton, Ohio; and Dr. Howard Lathrope, agronomist for the Nitrogen Division of Allied Chemical & Dye Corp.

Mr. Pesek emphasized the dollar return of fertilizers, indicating that much can be gained through knowledge of crop responses to different quantities of fertilizer.

Mr. Cecil declared that the nitrogen solutions dealer can impress his customers a great deal by having good storage tanks and application equipment on hand. Not only does it impress customers, but it is good business, he declared.

He showed on the screen a series of slides picturing various types of storage and application equipment, and commented that the presence of these facilities lets everyone know that the dealer is a "solid citizen" who is in business to stay.

Last speaker on the convention program was Dr. Lathrope, who developed the theme, "New developments on the horizon, and where do we go from here?" His energetic shirt-sleeve presentation comprised largely screen-projected pictures of various types of equipment and stories of dealers who have made a success of their nitrogen solutions business. He pictured fields where nitrogen had been applied and other shots of check plots where the corn looked very sickly and weak. "It is nitrogen that makes the difference," he told his audience.

Members of the board of directors named at the Omaha meeting are as follows:

Geo. H. Serviss, G.L.F. Soil Building Service, Ithaca, New York; Wm. B. Spargur, Delavan Mfg. Co., West Des Moines, Iowa; B. B. Woodward, Planters Cotton Oil & Fertilizer Co., Rocky Mt., N.C.; Wayne Johnson, Johnson Bros. Mill, Shenandoah, Iowa; A. J. Schuler, Welcome Agr. Chem. Co., Welcome, Minn.; Dick Cecil, American Nitrogen Corp., Dayton, Ohio; Don Foster, Nitrogen Solutions, Ottawa, Ohio; Roy Broyhill, Broyhill Co., Dakota City, Neb.; John White, John White Fertilizer Co., Auburn, Neb., and W. H. Schelm, Schelm Bros., Inc., E. Peoria, Ill.

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WORLD REPORT

Industry News from Everywhere

By GEORGE E. SWARBRECK
Croplife Canadian and Overseas Editor

Canadian Ammonia

The expansion of Canada's anhydrous ammonia industry is proceeding at a rapid pace as fertilizer firms prepare to meet the expected growth in demand. Plans for the construction of three new plants have been announced in recent weeks, a fourth company is expanding its existing capacity and now a fifth, Canadian Industries (1954), Ltd., has taken the wraps off a project to build a plant at Millhaven, Ont.

The newly formed company, Quebec Ammonia, headed by Robert Campbell of Vancouver, is to build a plant with a capacity of 125 tons a day at Contrecoeur, near Sorel, Que., with additional facilities for the production of nitric acid and ammonium nitrate. The cost is estimated at $7.5 million. Mr. Campbell is associated with the company building a new plant near St. Paul, Minn.

Northwest Nitro-Chemicals is to build a plant for the manufacture of ammonia and high analysis nitrogen and phosphate chemical fertilizers in the Etzikon gas field of Alberta. Participating in this scheme are Commercial Solvents Corp., New York, and New British Dominion Oil Co., Calgary. The cost has been estimated at $20 million.

The third new development is that led by Canadian Hydrocarbons for the erection of a synthetic fertilizer plant in the Winnipeg district. This plant is expected to produce 600 tons mixed fertilizers a day including 80 tons fixed nitrogen.

The company already established and proceeding with expansion is the Dow Chemical Co. of Canada, Ltd., at Sarnia, Ont. Full production is expected in the next two or three weeks.

CIL Plan

CIL 54 has called for tenders for the construction of the proposed Millhaven plant. The plan is to use bunker C fuel oil as the basic raw material. Although a substantial proportion of the ammonia production will be used by CIL in its own chemical operations, a proportion will be available for outside disposal. A major consideration which led to the siting of the plant at Millhaven was the availability of transportation, both for raw materials and finished products, over the Great Lakes waterway system.

Fungicides

Farmers are being recommended to treat their seed wheat, oats, barley and flax with fungicide in order to get the best results and avoid damage from smut. In this connection the Canadian authorities have again issued a warning which is applicable to farmers elsewhere.

Every year the Canadian grain inspection department has to condemn several cars of grain because of the presence of a few kernels of grain treated with fungicides. The contents of the cars cannot be allowed to go into human consumption and the whole load has to be condemned. The greatest care in cleaning up the remnants of the treated grain is necessary to avoid loss, officials warn.

Tips from Britain

British sources have been experimenting with new feeding methods for tomato plants. Reports claim that plants which do not get enough carbohydrates through lack of sunshine have been sprayed with a sugar solution to give an increased yield of 25%. Better results were obtained in another area by spraying with a solution of 1 lb. sugar, 1 gal. water, 1 gm. sulfanilamide and 1 gm. wetting agent weekly.

Another tip from the British: growers sometimes have trouble with papier mache pots because bacteria in the soil tends to rob that soil of the nitrogen it contains in order to break down the chemical structure of the paper. This difficulty can be overcome if the pots are soaked with liquid manure, watered with liquid nitrogen, or have dried blood put in the soil.

The best and cheapest remedy for tobacco mosaic in tomato plants is to apply one pt. skim milk in 10 pt. water. The solution should be applied by atomizing equipment, 5 gal. to the acre. Crops should be first sprayed in the seed boxes and once a week thereafter, the British experts say.

British Firm Quits Potash Exploration

LONDON — Imperial Chemical Industries, Ltd., one of Britain's leading manufacturing firms, has decided that it is not in a position to proceed with the development of potash deposits located in northern Yorkshire.

The company has spent the equivalent of $1,120,000 during the past seven years in exploring the deposits with a view to commercial working. The announcement said "The winning of the deposits would present difficult problems which can be solved only by an organization familiar with the special deep mining techniques involved, which ICI, as a manufacturer of chemicals, does not possess."

The discovery of the deposits arose from the oil prospecting program of the D'Arcy Exploration Co., in 1938. Potash bearing brine as well as evidence of deposits of sylvinite, a mixture of sodium chloride and potassium chloride, were found in borings at Aislaby, near Whitby.

Shortly after the war, ICI put down boreholes to discover how much potash bearing brine was available and to prove the extent of the deposits of sylvinite. The statement reports "The borehole program failed to find any promising potash bearing brine but proved the existence of two beds of sylvinite, at depths from 3,500 ft. to 4,500 ft., the lower bed extending over an area of 24 sq. mi. and containing between 20% and 40% of potassium chloride. About 350 million tons of potassium chloride can be regarded as the likely deposit proven. Assuming an extraction efficiency of 30%, about 100 million tons of potassium chloride, equivalent to 200 years' home consumption at present levels, can be regarded as existing in northern Yorkshire."

Fisons, Ltd., another leading British chemical firm, has been associated with the enterprise since 1948, and 11 boreholes were sunk by the companies concerned.

American Cyanamid Wins Sales Tax Case Against New York City

NEW YORK—The American Cyanamid Co. won its sales tax test case against New York City in a ruling handed down March 3 by the New York State Court of Appeals at Albany.

The chemical firm was joined by the Commerce and Industry Association of New York, Inc., in appealing the city's contention that it was responsible for determining the accuracy of its customers' resale certificates.

Buyers involved had supplied American Cyanamid with certificates claiming purchases were for resale and exempt from the city's sales tax. The chemicals sold to these customers were actually used in various manufacturing processes, and the city contended that the seller should have known by the nature of the customers' businesses that the claims in the certificates were untrue.

Associate Judge Charles S. Desmond in the court opinion said:

"This law, which goes very far in burdening the vendor by making him an unpaid tax collector of the city, does not, expressedly or impliedly, put on him a duty of investigating or policing his own customers. The problem of taxability or not is sometimes a difficult one as to items which are not resold as such but which may or may not be considered as becoming components of another article which is to be resold. We do not think the statute forces a vendor to debate such questions with his customer."

An official of American Cyanamid said the firm was very pleased with the decision. The purpose of the test case, he said, was to prove that resale certificates providing for exemption of the city's sales tax had important meaning. The seller relies on their validity, he added, and it would be unthinkable to hold sellers liable for the accuracy of their customers' statements.

MIXTURES

(Continued from page 6)

insecticides into fertilizer mixes included wettable powders, but these proved to be too dusty for practical application. Toxicity of the material was a hazard when too much dust was involved. The presence of dust in the process also meant the loss of too much of the material via the plant's vent system.

Later, to reduce the dust hazard, oil-impregnated dust was used, which was an improvement, but still less successful than was considered possible. One difficulty with this type of insecticide-fertilizer mixtures was that when bagged, there was a tendency toward segregation.

All of these methods, plus some additional ones, preceded the final means of spraying the insecticide onto the moving belt of granular fertilizer.

"In making an installation," Mr. Lemmon says, "we stay with the fertilizer plant until the process is running satisfactorily. Although we do not sell the equipment used, such as nozzles, pumps, motors, etc., we make every effort to advise the fertilizer man by offering catalogs, and other literature which will make it easy for him to procure what he needs."

Once under way, sales of the fertilizer-pesticide mixture is then the responsibility of the mixer. Major activity to date has been in the corn belt states, but the idea is expected to spread into other areas, Mr. Lemmon says.

IRRIGATION SCHOOL

LEXINGTON, KY.—An irrigation school has been scheduled at the University of Kentucky March 22-23.

Nitrogen Plentiful, Idaho Meeting Told

LEWISTON, IDAHO — About 100 fertilizer dealers and farmers were told here recently that actual nitrogen commercial fertilizer is plentiful now for the first time.

Dick Kube of Spokane, representative of the Balfour Guthrie Co., told a meeting in the Clearwater Power Co. auditorium that production of this principal fertilizer for north central Idaho farms has caught up with the increasing demands.

It was pointed out at the session, presided over by Joe Thometz, county agent, that the use of actual nitrogen in Idaho has doubled during the past year. Greater use of soil analyses, crop rotation and organic additions has made it profitable to use 40 to 50 lb. of the fertilizer per acre instead of the 30-lb. limit recommended a few years ago, he said. Where moisture is adequate, up to 100 lb. sometimes is applied now.

Charles Painter of Boise, University of Idaho extension soils specialist, said the greater application of fertilizer was paying in higher yields of wheat and other grains.

Roger Harder, assistant agricultural agronomist at the University in Moscow, spoke on the value of such green manure crops as sweet clover, field peas, alfalfa and grass. Although using green manure has been practiced for years, he said, it's being used more effectively now along with the commercial fertilizers.

Gloomicides

A U.S. Army officer stationed in Australia decided to go on a kangaroo hunt. He climbed into his jeep and instructed the driver to proceed to the kangaroo plains. Soon they spotted one, and the driver drove the jeep in hot pursuit.

For some time they went at breakneck speed without gaining on the animal.

Finally, the driver shouted to the officer: "Ain't no use chasin' that thing, sir!"

"Why," asked the officer.

"'Cause we're doin' 65 and that critter ain't put his front feet down yet!"

★

Waiter: "May I help you with the soup, sir?"

Diner: "What do you mean, help me? I don't need any help."

Waiter: "Sorry, sir. From the sound, I thought you might wish to be dragged ashore."

★

A Texan walked into the bar of a New York night club, saw a customer lying helpless on the floor and, pointing to him, said: "Give me some of that."

★

The boys at the roundhouse observed that one of the crew was unusually glum, and asked what was bothering him.

"I think my wife is tired of me," he replied.

"What makes you think so?" inquired a marital-wise friend.

"Every day this week," he answered, "she has wrapped my lunch in a road map."

★

A small boy came home from his first day at Sunday school and began emptying his pockets of money—nickels, dimes, quarters—while his parents gasped. Finally his mother asked:

"Where did you get all that money?"

And the youngster replied:

"At Sunday school. They have bowls of it."

W. H. GARMAN

(Continued from page 6)

$3 for each $1 these farmers spent for fertilizer. Worthy of note, too, is the fact that a comparable return can reasonably be expected by any intelligent farmer who follows the practices recommended by his agricultural college.

Another comparison is available in figures recently released by the University of Missouri, in cooperation with the National Fertilizer Association. This study showed that corn, when fertilized as is presently done in Missouri, averaged 40 bu. an acre with a profit of $17. If fertilized according to experiment station recommendations, the average state yield would be 65 bushels, and the profit woud be $36 an acre.

This amounts to a 100% increase in profit! Production cost for the high and low yielding corn was $39 and $55 per acre, respectively.

Additional data with reference to corn production are seen in a survey of the five-year average for corn grown with adequate mineral fertilization. Without any added nitrogen, the five-year average yield was about 54 bu. an acre in comparison with an average yield of 86 bu. when 150 lb. nitrogen were used. The plant population in both cases was 10,000.

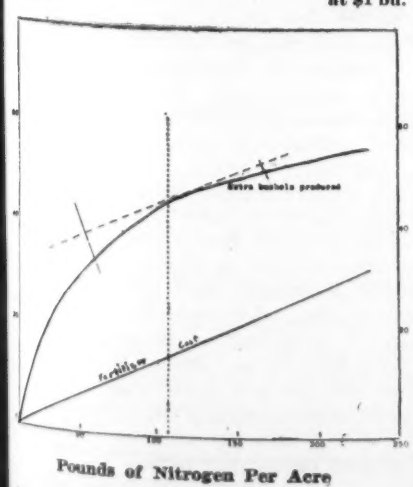
When 150 lb. nitrogen were used, however, with a plant population of 16,000, the average yield was 100 bu. an acre. This shows how important it is to utilize enough plants to take advantage of the higher fertility level.

Another illustration shows how important fertilizer is in reducing corn production costs. When no fertilizer was used, it cost $.84 to grow a bushel of corn, in this test by the University of Missouri. When $4.50 worth of fertilizer was used, the cost dropped to $.76 a bushel; but when $14.90 worth of fertilizer was used, the cost was only $.58 for each bushel of corn! The respective net returns for the three situations were respectively $19.75, $28.75, and $65.60. This is just one more excellent example how fertilization can be used to increase profit per acre and reduce production costs per unit.

Other data, also from the University of Missouri, emphasize the importance of fertilization when considered from the standpoint of a rotation of corn, soybeans, wheat and hay. (Figures are based on one acre in each crop annually, or a total of four acres.) With a low rate of fertilization (fertilizer cost $4.50) the net profit for the four acres amounted to $26.55.

When the fertilizer used was increased to $10.50, however, the profit was $45.30. When fertilizer was applied according to soil test recommendations, however, the net profit for the four acres jumped all the way to $126.65.

Additional information may be gained from the same experiment, although based on slightly different selling prices for corn, soybeans, wheat and hay. With slightly lower figures for each crop, the low rate of fertilization results in a loss of $8.20 for the four acres of the rotation. When the fertilizer used amounted to $10.50, the net return was only $4.30 (whereas in the example cited above, it was ten times that amount, or $45.30).



When fertilization was based on soil tests, the net return was $54.45 (whereas in the previous example it was $126.65). Inasmuch as all costs were the same in these comparisons, the results serve to emphasize the profits that can be expected with different crop prices.

It is as simple as this. With adequate soil treatment, profit can be realized even when prices are low. Without adequate treatment, no profit it is likely and a loss is quite probable.

Some interesting studies have been made by Purdue University on top dressing wheat with nitrogen. For the 1953 wheat harvest season, nitrogen was most profitable when applied in February and March, returning $25.50 and $31.00, respectively, for 30 and 60 lb. nitrogen. It was found, however, that there was little difference in the return from 60 lb. nitrogen applied on December 22, from that applied at 30 lb. the same date.

The main point of this experiment is that top dressing wheat in the fall was less profitable than when done in the winter or spring, and that top dressing with 30 to 60 pounds of N can return from $19 to $31 on each acre.

Another Purdue study revealed what the effect of adding supplemental nitrogen in a rotation has on wheat yields. In a corn, wheat and clover rotation, wheat averaged only 16 bu. an acre. When soybeans were included, in addition to the clover, the yield was only 3 bu. higher, or 19 bu. an acre. But, when 25 lb. nitrogen were applied as a top dressing in the spring, yields were increased 7 to 8 bushels to the acre. In terms of prevailing prices, this meant a return of more than $4 for each $1 spent for nitrogen.

Results of another rotation experiment indicate that while there was little difference in yields of corn, soybeans, or wheat between 600 or 1,200 lb-an-acre treatments of 0-12-12, there was a decided jump when nitrogen was added to both the corn and wheat. The 7-year average yield of corn was raised by 14 bushels with the addition of 96 lb. N. This returned an added profit of about $8 an acre each year. Application of 30 lbs. on N on the wheat crop raised the average yield by 7.6 bushels, and returned a profit of more than $10 an acre.

Still another illustration of how important balanced nutrition can be has been worked out by Purdue. On a plot where corn had been grown continuously since 1919, the use of 40 lb. N plowed under with the corn stalks, in addition to the initial 200 lb. of 0-12-12, resulted in the addition of 21 bushels to the average yield. This is approximately 1 bushel for each 2 pounds of N.

An additional 40 pounds of N raised the yield by 10 bushels. That is one bushel for each 4 pounds of N, and is profitable, though only half as efficient in terms of pounds of corn as was the first 40 pound application of N in this experiment.

Not only do corn, soybeans and hay profit from the application of additional applications of fertilizer, but wheat, also, has shown significant increases in a series of experiments at Purdue. On one of these tests, lime alone raised the average yield from 7 to 17 bu. of wheat per acre. Adding 48 pounds of P_2O_5, in addition to the lime, raised the yield from 17 to 28 bushels. Adding 48 pounds of K_2O in addition to both the lime and the P_2O_5 raised the yield from 28 to 34 bu. per acre.

All these are very significant increases in terms of dollar returns.

But beyond that, when 48 pounds of N are included in addition to the lime, P_2O_5 and K_2O, the average wheat yield was 44 bushels!

That is good wheat, and only lime and the equivalent of 400 lb. an acre of 12-12-12 were required. It is interesting to note that this treatment yielded 41 bushels without lime. This probably means that calcium was lacking in the soil, and that the deficiency was taken care of either by the lime or by the phosphate fertilizer.

Annual fertilizer trials with wheat conducted by the agronomy department of Purdue University obtain data from plots in 11 to 30 counties each year. In this case, it is surprising to note that even without any added fertilizer, the average for the 7-year period was 24.1 bushels per acre, a tribute to the general fertility level at which many Indiana soils are being maintained.

Where the average fertilizer used was between 150 and 200 lb. an acre, the yield was 28.7 bu., or only about 2 bu. less than where the average amount of fertilizer was between 300 and 400 lb.

Applying 25 lb. nitrogen top dressing in the spring raised the average yield of 5.6 bushels (from 30.5 to 36.1 bu.). While this is not outstanding, it represents the average of many different farms and still shows a return of around $2.50 for each dollar spent for nitrogen.

Comparing the unfertilized wheat yield of 24.1 bu. per acre with the yield of 36.1 bu. where 300-400 pounds of fertilizer plus 25 lb. N were used, we see that 12 bu. wheat were obtained. The cost for the fertilizer and extra nitrogen was about $10, so this wheat cost about $.90 a bushel to raise. At today's prices, that is not too bad.

When yield is raised from 24.1 bu. to the acre to 36.1 bu. by fertilization, this amounts to a 12-bushel increase, or almost exactly 50%. It means that instead of planting 40 acres, a grower could get the same total yield from 27 acres. Thus, if all farmers followed approved practices to the best of their ability, we would meet our needs for food and fiber by drawing on only about half of the land now in cultivated crops and improved pastures.

With total farm production the same, but accomplished on 50% less land, more money can be realized. Fertilization, along with other sound practices, offers the farmer the greatest opportunity in sight anywhere for any segment of our industrial or agricultural economy.

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The wise farmer is heading in this direction at a rapid pace. He should be considered the one who is not actually feeling the "cost-price squeeze." If he farms as he should, he won't need all of his acres. He can sell as much milk, or beef, or corn, or wheat as ever, and at the same time, make much more profit.

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COTTON PRODUCTION CONFERENCE

(Continued from page 1)

growth on the plants, thus making repeated applications unnecessary, he said.

Insect control research is an important factor in making Arizona one of the most outstanding cotton producing areas in the world today, Mr. Ewing said. He noted that of the top five cotton-producing counties in the U.S. during 1953, two were in Arizona (Maricopa and Pinal). The five counties (three in California) produced one-eighth of the total U.S. cotton crop that year, he added.

In reviewing briefly cotton insect research of the past quarter-century in this part of the Cotton Belt, he emphasized that improvement of all production practices has made the West one of the world's most important cotton production areas.

Mr. Ewing pointed out that there is general agreement among entomologists and farmers who have tried early season insect control that it insures early normal growth, early fruiting and early maturity.

"Early growth often makes cultivation and weed control easier and less expensive," Mr. Ewing said. "Early fruiting and maturity often mean less vegetative growth and more efficiency in mechanical harvesting of the crop, as well as less expensive late season control."

He emphasized importance of more study on systemic insecticides. Three major problems involved here, he said, include the need for better methods of treating seed, more information on the effect of systemics on seedlings and determination of whether undesirable residues are left in the seed.

Other research problems connected with cotton insects that need investigation or expansion include insect resistance to insecticides; effectiveness of virus, fungi, and bacterial diseases; screening of more chemicals; nutritional requirements of insects; insect resistance in plants; and the physiology and biochemistry of cotton insects.

"In view of the potential destructiveness of the pink bollworm, the over-all research program on this insect needs to be further expanded," Mr. Ewing said.

Chemical disease control is a profitable cotton production practice when root-knot nematode is the primary cause of damage, Dr. M. W. Allen, University of California pathologist, told the conference. He said that crop losses due to this parasite can be minimized by cultural procedures such as crop rotation and summer fallow, or a combination of both.

Chemicals that will do the job as area treatments include an 83% solution of ethylene dibromide applied at the rate of five to six gal. per acre and a DD mixture at the rate of 20 gal. per acre, he said, adding that such applications have given excellent results in tests and commercial applications during the past 10 years.

DD at nine gal. per acre applied as a preplanting row treatment for three successive years resulted in a net profit of $225 an acre, averaging $75 per acre per year. In other tests, DD applied at 20 gal. per acre, followed by nine gal. in row treatments in 1953 and 1954, gave a net profit of $240 per acre for the three-year period. Row treatments with ethylene dibromide applied at 2.5 gal. per acre gave an average net profit of $21 an acre, Dr. Allen reported.

He said a new chemical to combat the nematode, known at this time only as OS1897, gave "outstanding control" when tested in 1953 and 1954. Cotton yields resulting from this new material were about equal to those obtained from DD and ethylene dibromide in comparative tests.

"This material is now being suggested for use in California against root-knot nematode of cotton," Dr. Allen said.

Carefully controlled tests on New Mexico and Arizona cotton during 1953 revealed that nearly a full-grade improvement resulted from defoliating cotton plants to facilitate harvesting, it was reported by Victor L. Stedronsky, U.S. Cotton Ginning Research Branch Laboratory, Mesilla Park, N.M.

It was demonstrated, too, Mr. Stedronsky said, that there were no adverse effects on the spinning qualities of the tested cottons. Picker and card waste, neps in the card web, and yarn appearance "were not significantly affected as a result of defoliation," he said.

Delegates were told that a material called amino triazole (Amizol) checks second growth and at the same time facilitates defoliation when added to other defoliants.

Tests have demonstrated, said Lamar C. Brown, USDA plant physiologist from Sacaton, that this chemical will not affect the germination, boll characteristics or fiber properties of mature cotton if used as currently recommended.

Mr. Brown added that amino triazole, when used alone, is an effective defoliant. It also enhances the defoliating efficiency of other chemicals, while inhibiting the re-growth of new foliage.

"Certain herbicidal effects also have been observed such as destruction of weeds in cotton rows," he said. "These results were obtained by using combinations of amino triazole and any of several commercial defoliants at reduced rates."

The western section of the Cotton Belt comes close to being the area where proper use of defoliants is most difficult and therefore requires a high degree of knowledge and precision if the application is to be profitable, W. H. Tharp, USDA physiologist, said.

For this reason, he added, this part of the country has become the proving and testing ground for new chemicals and for new application procedures and equipment. It leads also in development of the new knowledge needed to keep yields high, preserve quality and improve machine harvesting efficiency.

The speaker warned against improper use of modern defoliating chemicals.

"Use these harvest aid chemicals to get the leaves out of the way for machine picking," he said. "Use them to straighten up lodged plants. Use them to help get the sunlight and dry air down to the bottom bolls and thus prevent boll rots. Use them to make mature bolls open faster so you can get your cotton out early. But, please don't use them to make bolls mature faster. It just can't be done. It can only make immature bolls stop developing and eventually open to contain weak seed and thin-walled fiber."

Cotton growers at the conference were told that they should avoid "package deals" for aircraft application of insecticides.

L. A. Carruth, Department of Entomology, University of Arizona, said that a package deal usually involves a transaction between a grower and a single individual or organization in which a single charge covers both the purchase of insecticides (or other agricultural chemicals) and their application. Preliminary checking of fields to determine the need might also be involved, he said.

"Pest control includes diagnosis, prescription, formulation of chemicals and application," he said. "The growers themselves should be more effective in diagnosing pest conditions in their own fields and should be more aware of the latest and most effective 'prescriptions' for controlling each pest, as found in the recommendations of the Agricultural Extension Service."

Formulation of insecticides and aircraft application of insecticides are "separate and distinct" activities, Mr. Carruth emphasized, each using expensive and specialized equipment and highly trained personnel.

"To attempt to secure both these services from a single individual or agency is to 'eliminate the experts' in one service inviting the use of improper or inferior materials, inadequate application and lowered control effectiveness. Growers are advised to purchase properly recommended materials from reputable dealers and to have such materials applied by competent applicators using adequate aircraft equipment."

P. J. Lyerly, superintendent, Texas Agricultural Experiment Station, Ysleta, Texas, told the delegates that the application of Alanap at planting time at the rate of four to five pounds per acre controlled early season annual grasses until late June.

Application of the chemical at higher rates gave longer control, he added. In some cases, almost perfect control of annual weeds was obtained for the entire season. He said that Alanap was effective against germinating weeds only and not against established perennials.

Mr. Lyerly listed a new hormone-type herbicide known as Dalapon as promising for controlling many grasses. Another herbicide, Silvex, "appears very promising for the control of bindweed and several other broadleaf plants," he said.

Flame cultivation and oil application controlled most annual weeds common to California cotton fields in recent tests, Chester L. Foy of the University of California reported.

He said the use of oil and flame or flame alone increased the yield, increased mechanical picker efficiency, reduced trash content and "upgraded the cotton as much as two grades."

Arizona's cotton yield in 1954 was well above the average because of a late fall and fewer insects, J. N. Roney, extension entomologist from Phoenix, told the conference.

Mr. Roney said that the Lygus bug returned last year to thwart the efforts of some growers. The cotton leaf perforator caused se'ous injury in several parts of the state, because of failure of growers to apply control measures correctly, Mr. Roney said. This insect is most important in central and southern Arizona and heavy outbreaks occurred in Yuma County late last season.

Andrew Bergero, Scottsdale, Ariz., told the conference how he produced two bales per acre of extra-long staple cotton last year.

Mr. Bergero's production practices included soil preparation, planting, fertilization, irrigation and insect control.

Mr. Bergero applied dust four times during the season, three for Lygus bugs and one for bollworms.

George C. Templeton, Glendale, Ariz., spelled out his techniques in producing three bales per acre of upland cotton last year.

He outlined, step by step, irrigation and cultivation procedures, fertilization, insect control and harvesting. Defoliation of the plants late in the season is done by airplane, he said.

"I irrigated my (cotton) eight times and used approximately five-acre feet of water," he said. "I fertilized two times, dusted three times for insects and cultivated eight or nine times. It took somewhere around $100 per acre to produce my three bales of cotton per acre."

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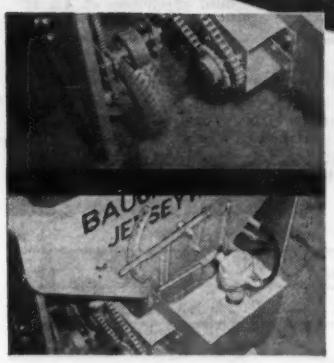

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POTASH PLANT

(Continued from page 1)

page 1 of the Jan. 31 Croplife.)

Kerr-McGee has announced plans for immediate work on a plant to develop the reserves, estimated at more than 100 million tons.

The move is part of an expansion in the farm chemicals field for NFU. C. E. Huff, general manager, told Croplife that development of the firm's phosphate property in northeast Utah is expected to begin in late summer.

Also planned is an expansion in the pesticide field in 1956. Distribution in all lines will be extended into Corn Belt and Southeast states, Mr. Huff said.

Spring Farm Activity Gains in Mid-South

MEMPHIS—Warm, windy weather dried Mid-South farm land last week and ushered in general spring plowing. Fruit trees began putting out leaves and blossoms.

Some corn planting was reported in the southern part of the Mid-South by officials of extension services in Arkansas, Mississippi and Tennessee.

Arkansas fields and trees were taking on a tinge of green, but extension officials cautioned against any "premature" planting of cash crops. Some gardening might be safely done, but an extension spokesman advised farmers to hold off awhile from any extensive planting of field crops.

Many orchards were budding and owners were keeping an anxious eye on the weather for fear frost might catch the early buds.

Warm weather resulted in much activity on West Tennessee farms, according to Judd Brooks of Jackson, district agent.

"Ground is being broken on all but bottomland, which is still wet. Strawberries are being set out in most areas and cabbages are being planted in quantity."

Land breaking and deep placement of fertilizer kept Mississippi farmers busy as they rushed to get ready to plant the 1955 crops, the Mississippi Agricultural Extension Service said.

T. M. Waller, extension cotton specialist, said farmers are continuing to break hardpans in hopes of catching enough water in the subsoil to insure ample moisture for the cotton crop.

Corn planting is under way in the southern and central parts of Mississippi, specialists said. Grazing crops are making good growth and native grasses and clovers are furnishing considerable grazing, said W. R. Thompson, extension agronomist.

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Safety Earns Big Bonus for Firm

How a safety program pays off in dollars and cents for a large fertilizer manufacturing firm with multiple plants, is told in the following story, described to Croplife by a company spokesman. He reports that a saving of $699,000 has been realized through the plant's safety program since its own safety effort was launched late in 1947.

"Before beginning its organized accident prevention program in August, 1947, our firm had an accident frequency rate of 41.53. Today, the rate has been reduced to a figure of only 3.92," he explains.

"Perhaps to many people, this record may not mean much. They may be inclined to shrug their shoulders and say, 'That's quite a reduction all right, but the cost may be more than it is worth. What does it mean in dollars and cents?'

"Before going into detail as to how this was achieved, it would be well to explain how workmen's compensation premiums are calculated. Each job classification has a manual rate set for it. For instance, the rate for fertilizer factory workers in North Carolina at the present time, is $1.164 per $100 payroll. Each company has what is termed an 'experience modification rate.' This rate is determind by the amount of losses by the individual company caused by industrial accidents for the first three of the past four years.

"If the company has a loss record which is better than the average for all fertilizer manufacturing plants, the company has a 'credit experience.' By the same token, if the company's loss record is worse than the average of other fertilizer manufacturing plants, it will have 'debit experience.'

"Our company thus had a debit experience rating of 23.6% when the accident prevention program was begun in 1947. This meant that the company's loss record for the years 1943, 1944 and 1945, was much worse than the average record for the industry as a whole.

"It also meant that the workmen's compensation premium for the year 1947 was 123.6% for the manual rate. On the payroll which would have developed a manual premium of $50,000 (average manual premium for the company over the past seven years) the company instead, paid a penalty premium of $11,850.

"In 1954, however, the company had an experience credit of 35%. It was thus necessary for the firm to pay only 65% of the manual premium. Therefore a premium saving of $17,500 over the manual rate was secured. Further, an additional saving of $29,350 was realized over the cost of the premium that would have been due at the prevailing 23.6% credit experience of 1947.

"The average credit experience for the last seven years has been 26.0%. The average net saving has been 23.6% plus 26%, or 49.6%. Had the company paid the manual rate plus the 23.6% debit experience (which existed when the accident prevention program began in 1947) the total premium paid during the past six years would have been 123.6% of $300,000 or $370,800. The actual premium paid was only 74% of the manual rate, or $221,000. It may be seen, therefore, that the savings in workmen's compensation insurance premiums alone, for the six year period, amounted to $139,800.

"This amount of $139,800 is referred to by insurance companies as 'direct savings.' Since it is generally calculated by both insurance companies and industrial firms alike, that direct savings brought about by an improved safety record represents only about ¼ of the indirect savings, it is then figured that the indirect savings would amount to $559,200. This sum, added to the direct savings, brings the total to $699,000."

The company, name of which is available upon request, obviously believes in safety and has a strong case in supporting the cause. We thought its experience in reducing insurance rates through a well-integrated safety program would serve as an inspiration to other fertilizer manufacturers who may have wondered if they could gain anything by instituting a safety movement within their own plants. In the light of the above, the answer is obviously "yes."

Morse Code for Agriculture

True D. Morse, under-secretary of agriculture makes many talks around the country, but at his recent appearance before the National Agriculture Chemicals Association in St. Louis, he had some specific remarks to make about how the chemical industry is contributing to the general welfare through application of its products to agriculture.

He emphasized the need for wider dissemination of information on the use of various farm chemicals, particularly data of the type that underlines the dollar and cents value of these materials.

"Many farmers are confused by a whole list of chemicals and formulas and are uncertain about which to use and what results to expect," he said. "Companies may find it advisable to intensify their work with farmers who buy good equipment and who do custom work for their neighbors. The trend toward specialization will continue and it is reasonable to expect more custom workers and specialists working with farmers in the use of agricultural chemicals."

The under-secretary declared that there is no shortage of opportunities for chemicals to serve agriculture. "Industry and agriculture working together doubled the use of fertilizer in ten years," he said. "The use of fertilizers will continue to expand as more effective use is made of plant foods in the future. Increasing numbers of farmers will come to realize that high yields per acre usually mean increased profits," he added.

Not only in the use of fertilizers will agriculture prosper, Mr. Morse stated. There is also a long road ahead in cutting down the $13 billion loss suffered each year by agriculture because of weeds, plant diseases and insects. "We look to the chemical industry for the methods and products that will help to reduce these huge losses," he said. Basic research is the core of the matter, it was pointed out.

Along this line, the under-secretary declared that the results of agricultural research dwarf the benefits of most other types of farm programs. Research and education make farm bank accounts grow with better production and farming methods—and more effective selling and marketing.

Comments of trade people regarding Mr. Morse's talk were good, following his presentation at a luncheon meeting of the group. It is this type of publicity;—that much of the progress of modern agriculture is due to chemical developments, that will help overcome adverse and unfounded opinions.

CROPLIFE is a controlled circulation journal mailed to those responsible for the production and distribution of fertilizer and other farm chemicals and to retail dealers of the agricultural chemical industry in the U.S. To those not on the controlled list, CROPLIFE is available at $5 for one year, $9 for two years ($8 a year outside the U.S. and possessions). Single copy price, 25¢.

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MEETING MEMOS

March 22-24—National Farm Chemurgic Council, Inc., Annual Conference, Deshler-Hilton Hotel, Columbus, Ohio; John W. Ticknor, NFCC, 350 Fifth Ave., New York, conference chairman.

March 24-25—North Central States Branch, Entomological Society of America, East Lansing, Mich.

March 29-April 2—American Chemical Society, National Meeting, Netherlands Plaza Hotel, Cincinnati.

April 19—Minnesota Ground Sprayers Assn., Organizational Meeting, Conference Room of Coffey Hall, University of Minnesota Farm School, Jim March, Cambridge, Minn., Secretary.

Apr. 26 — Third Annual California Fertilizer Conference, sponsored by the Soil Committee, California Fertilizer Assn., University of California, College of Agriculture, Davis, Cal., Sidney H. Bierly, Executive Secretary, CFA, 475 Huntington Drive, San Marino, Cal.

May 15-17 — Chemical Specialties Manufacturers' Assn., Statler Hotel, New York.

May 19—Fertilizer Section, 25th Annual North Carolina Safety Conference, Robert E. Lee Hotel, Winston Salem, N.C.; William C. Creel, Safety Director, Department of Labor, State of North Carolina, Raleigh, Chairman.

June 2 — South Carolina Fertilizer Meeting, Sandhill Experiment Station, near Columbia, S.C.

June 3—Fertilizer Section, Virginia State Safety Association, Jefferson Hotel, Richmond, Va.; William C. Richardson Southern States Cooperative, Richmond, Chairman.

June 12-15—Joint meeting, American Plant Food Council, Inc. and National Fertilizer Association, Greenbrier Hotel, White Sulphur Springs, W.Va. Paul T. Truitt, American Plant Food Council, 910 17th St. N.W., Washington, D.C., in charge of registration.

June 28-30 — Sixth Annual Pacific Northwest Plant Food Assn. Regional Fertilizer Conference, Boise Hotel, Boise, Idaho, Leon S. Jackson, 702 Lewis Bldg., Portland, Ore., secretary.

Aug. 15-19 — American Society of Agronomy and Soil Science Society of America, University of California, Davis Campus.

Sept. 7-9 — National Agricultural Chemicals Assn., Spring Lake, NJ.; Lea S. Hitchner, NAC Executive Secretary, 1145 19th St. N.W., Washington 6, D.C.

Sept. 7-9 — Ninth Annual Beltwide Cotton Mechanization Conference, Texas A&M College, National Cotton Council of America, Box 18, Memphis 1, Tenn.

Oct. 17-18 — Fertilizer Section, National Safety Congress, LaSalle Hotel, Chicago, Thomas J. Clarke, Chairman.

Nov. 2-3 — Annual Convention, Pacific Northwest Plant Food Assn., Pilot Butte Inn, Bend Ore., Leon S. Jackson, 702 Lewis Bldg., Portland, Ore., Secretary.

Nov. 7-8—California Fertilizer Assn., Thirty Second Annual Convention, Hotel Mark Hopkins, San Francisco, Sidney H. Bierly, Executive Secretary & Manager, 475 Huntington Drive, San Marino, Cal.

Nov. 29-Dec. 2—Entomological Society of America, Netherlands Plaza Hotel, Cincinnati.

Dec. 5-7—Agricultural Ammonia Institute, Kansas City; Jack F. Criswell, Executive Vice President, Claridge Hotel, Memphis, Tenn.

Program Set for Farm Chemurgic Council Meeting in Columbus

NEW YORK—New crops, agricultural research, and the reorganization of the 20-year-old National Farm Chemurgic Council will be the highlights of the Annual Chemurgic Conference to be held at Columbus, Ohio, March 22-24, Henry T. McKnight, president, has announced.

Dr. Bryon T. Shaw, administrator, Agricultural Research Service, U.S. Department of Agriculture, leads off on "New Crops Research." His talk will uncover some of the crops, not now commercially grown in quantity, which can be planted in acres diverted from surplus-producing crops.

Another speaker will define crops for which industry has a need and which farmers of this nation can produce economically.

Ohio State University and the Ohio Experiment Station will jointly sponsor "Ohio's Show Window in Agricultural Research," offering symposia and an exhibit full of examples of modern research at work for farmers and for industry.

Smith Douglass Gives Soil Scholarships

ST. PAUL—Two new scholarships of $1,000 each will be offered beginning freshmen next fall who choose soils as a major field of study at the University of Minnesota. Announcement comes from William P. Martin, head of the university's Soils Department. The new scholarships are given by the Smith Douglass Co., Inc.

Through M. W. Mawhinney, manager of its plant at Albert Lea, the firm gave the Greater University Fund $6,000 to provide scholaships for two entering soils freshmen this fall, two in the fall of 1956 and two in the fall of 1957.

SPRING BARLEY

LAFAYETTE, IND.—Reduction of acreage of some grain crops in Indiana is reviving interest in spring barley, according to Purdue agronomists.

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TOPEKA, KANSAS — Fertilizer sales in Kansas during the last half of 1954 totaled 135,687 tons, according to the Kansas State Board of Agriculture. This is an increase from 116,108 tons sold during a corresponding period a year earlier.

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Allied Chemical & Dye Corp., Nitrogen Div. ...
American Potash & Chemical Corp. 17
Anco Manufacturing & Supply Co. .....
Ashcraft-Wilkinson Co. 7
Bagpak Division, International Paper Co. ....
Baker, H. J., & Bro. .....
Baughman Manufacturing Co. 20
Beaird, J. B., Company 11
Bemis Bro. Bag Co. .....
Bradley & Baker 23
Broadway Rubber Corp. .....
Burrows Equipment Co. .....
Butler Manufacturing Co. 13
Calcium Carbonate Co. .....
California Spray-Chemical Corp. .....
Campbell, H. D., Co. .....
Chase Bag Co. .....
Chemical Specialties .....
Chipman Chemical Co. 15
Clover Chemical Co. .....
Commercial Solvents Corporation .....
Croplife 24
Deere & Co., Grand River Chemical Div. .....
Diamond Alkali Company .....
Doane Agricultural Service .....
Douglas Chemical Co. .....
Ellsworth Equipment Co. .....
Export Chemical Corp. of Colorado .....
Fischbein, Dave, Co. .....
Frontier Chemical Co. .....
Gandrud, E. S., Co. .....
Geigy Agricultural Chemical Co. .....
Gotcher Engineering & Mfg. Co. .....
Grace Chemical Co. .....
Grand River Chemical Div., Deere & Co. .....
Hahn, Inc. .....
Hammond Bag and Paper Co. 21
Henderson Mfg. Co. .....
Hercules Powder Co. .....
Highway Equipment Co. 19
Hills-McCanna Co. .....
Hypro-Engineering, Inc. .....
International Minerals & Chemical Corp. ....
International Paper Co., Bagpak Division ....
K. B. H. Corporation, The .....
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Specifide, Inc. .....
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Stoker, H. S., Company .....
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Thompson-Hayward Chemical Co. 19
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